

Flight, August 31, 1912.

FLIGHT

First Aero Weekly in the World.

A Journal devoted to the Interests, Practice, and Progress of Aerial Locomotion and Transport.

OFFICIAL ORGAN OF THE ROYAL AERO CLUB OF THE UNITED KINGDOM.

No. 192. (No. 35, Vol. IV.)

AUGUST 31, 1912.

[Registered at the G.P.O.
as a Newspaper.]

[Weekly, Price 1d.
Post Free, 11d.]



A fine *vol plané* by Bobba over the Grand Stand in the Paris-Amiens flying race.

EDITORIAL COMMENT.

The Value of Aircraft in War.

It is, perhaps, only natural that the attention which the War Office Aeroplane Trials have attracted should have turned the thoughts of those who follow the progress of aviation with more than a passing interest to the rôle of the aeroplane in war. We ourselves are not disposed to dogmatise upon the subject. That is for the professional soldier-student to do, and all we propose to undertake is the dissection of the opinions of those with a closer acquaintance than we possess with the accomplishments and possibilities of military aviation. Quite recently there has been two notable contributions to the sum of knowledge of these matters, which are well worth something more than passing notice. The first of these is from the pen of *The Times* correspondent with the Italian forces in Tripoli. This is the brief record of the Italian military airmen as outlined by *The Times* correspondent :

"No one could have watched the work of the Italian airships and aeroplanes in Tripoli, without being profoundly impressed by the skill and coolness of their pilots and firmly convinced of the practical value of aviation in war. It is, of course, true that the conditions have been specially favourable ; but in any case it is already clear that no nation can afford to go to war with a marked inferiority in aerial strength. The various flights accomplished by Capt. Moizo, Capt. Piazza, and Lieut. Gavotti, to Gharian and Tarhuna and back—140 miles over an enemy's country—stand out as the feats which make most appeal to the imagination. But in the judgment of the writer, the most remarkable features of the winter's work are the frequency and regularity of the ascents and the complete freedom from serious mishap. There were narrow escapes. On a number of occasions the aeroplanes were hit by rifle bullets ; two airmen were wounded, one seriously, but both were able to fly back to camp ; and on two other occasions a flight nearly ended in disaster owing to the stoppage of the motor. Each time a long *vol plané* from a great height brought the airman to the ground in safety within the Italian outpost lines. But luck was only the just reward of the skill and certainty displayed. Strong winds blew in Tripoli with unusual persistence during the greater part of last winter. Yet in six months Capt. Moizo made no fewer than 82 flights, Lieut. Gavotti 80, Lieut. Roberti the same number, and Capt. Paizza 70, while many other airmen made numerous brilliant ascents. By means of these scouting expeditions the Italian generals were regularly apprised of the enemy's movements and strength, the country between the coast and the mountains was carefully explored, and its main features noted. This work was of the greatest assistance in determining the errors in existing maps, and furnishing details for the new *carte dimostrative* which have been compiled since the occupation."

The most wonderful feature of the record is that all these flights, which are very properly described as brilliant, have apparently been accomplished without the loss of a single airman or machine.

There is another point which is discussed by *The Times* correspondent and which, in view of previous articles in these columns on possible developments in dirigible construction, has a good deal of significance. After detailing the services performed in Tripoli by the Italian airships P2 and P3, he goes on to say that—

"For military purposes the airship has many advantages over the aeroplane. We are probably at the beginning of a long struggle between the advocates of the aeroplane and those of the airship. In reconnaissance the airship's radius of action is enormously wider than that of the aeroplane. It can remain stationary, allowing accurate photography and a much greater precision in bomb-dropping. While an aeroplane is of very doubtful value for night work, the operations of an airship are little hindered by the darkness. Even on moonless nights it is possible to distinguish objects on land or sea, while two notable advantages attach to nocturnal work—the airship does not lose gas and it remains all but invisible. There are other advantages. An aeroplane pilot wears out rapidly under war conditions, whereas the crew of an airship can continue more or less indefinitely. In the ordinary course of events, one airship should outlast 14 aeroplanes. Repairs total up to a considerable

sum. Thus it is calculated that M1, which cost £12,000 to construct, will require about £8,000 spent in repairs and renewals during its estimated life of eight years. But £20,000 does not seem an excessive sum to spend upon a satisfactory airship.

"When we come to the day of battles in the air, it is possible that the airship will prove too vulnerable to the handier aeroplane employed in flotillas. But various means of remedying this defect are being studied, and in Italy great hopes are entertained of a pneumatic gun, to be fired by compressed air. In any case, at the present stage of development, the airship has certain obvious advantages which cannot be ignored. Both types of aircraft must be provided by a nation which has to consider the prospect of war."

There is little or no need for comment on the statements offered in these quotations.

The second contribution to contemporary opinion on military aviation is in the shape of an article in the *Daily Telegraph* on "Aeroplanes in the French Manœuvres." According to the correspondent there are to be mobilised no less than 86 machines to assist in the general manœuvres in Poitou and in the separate army corps operations which provide the large-scale war training of the French Army. Even to the minds of the most optimistic it must seem almost a work of physical impossibility to overtake the enormous start which France has secured over us. A round million sterling is being spent this year, and 300 machines are being added to the 208 which were in commission at the beginning of the year. In 1913 and 1914 yet another 500 are to be purchased, until the French army has at its disposal the enormous number of a full thousand aeroplanes.

Reverting to the subject of the place of aircraft and particularly of the aeroplane in war, the *Telegraph* quotes some exceedingly interesting remarks made by M. Clementel, commenting upon the results achieved in last year's French manœuvres.

"It is not necessary," he said, "to go so far as some superficial thinkers have gone, who imagined that the new auxiliary of the army would completely change the character of war in the future. It is not even necessary to say that the aeroplanes employed in manœuvres or actual warfare will play a preponderant rôle or that their presence alone would justify the suppression of cavalry scouts. The still more exaggerated supposition that aeroplanes could be used to destroy fortifications and to scatter a whole army by dropping explosives is still premature. But what the aeroplane does achieve is to bring the work of reconnaissance to a perfection it had never attained before."

That, too, seems to have been the lesson learnt by the Italians in Tripoli.



AWARDS.

The Army Council, on the recommendation of the Judges' Committee, have awarded the following prizes in connection with the Military Aeroplane Competition.

Prizes open to the world:—

First prize, £4,000, to S. F. Cody, for Cody biplane (British).
Second prize, £2,000, to A. Deperdussin, for the Deperdussin monoplane (French), No. 26.

Prizes open to British subjects, for aeroplanes manufactured wholly (except the engine) in the United Kingdom:—

First Prize, £1,000, to S. F. Cody.

As no other British aeroplane completed all the tests, the two second prizes will be withheld, but the three third prizes of £500 each are awarded to:

British Deperdussin Co. for Dep. No. 21.
British and Colonial Co. for Bristol monoplane No. 14.
British and Colonial Co. for Bristol monoplane No. 15.

The following entrants, whose aeroplanes were submitted to all the tests, will receive £100 in respect of each aeroplane:—

M. Ducrocq, for Hanriot monoplanes (French) Nos. 1 and 2.
Aircraft Co., for Maurice Farman biplane (French) No. 22.
L. Blériot, for Blériot monoplanes (French) Nos. 4 and 5.
A. V. Roe, for Avro biplane (British) No. 7.

PARKE'S DIVE.

Salisbury Plain, Sunday, August 25th.

HERE is the true story of one of the worst experiences in mid-air from which any pilot has extricated his machine in absolute safety, and as the circumstances precisely represent the hypothesis of the most debated problem among pilots at the present time, the following particulars should be studied with the closest attention by all.

At four minutes past six this morning Lieut. Parke, R.N., accompanied by Lieut. Le Breton, R.F.C., as observer, started on the Avro biplane (60-h.p. Green engine) from Salisbury Plain for the three hours' qualifying flight in the Military Trials. At ten minutes past nine, having more than completed the required duration, he was returning from the direction of Upavon for the express purpose of alighting in front of the sheds.

The direction of flight was practically towards due south; the wind was blowing approximately from the south-west, with a tendency to back southwards. He was, therefore, flying virtually up wind. The speed of the wind was estimated about 10-15 m.p.h. by the pilot, and the maximum air speed of the machine with the present propeller is about 60 m.p.h., as tested over the measured distance yesterday. The engine was pulling well, and the machine in perfect trim. There was bright sunshine and some clouds.

Throughout the flight an altitude of between 600 and 700 ft. was maintained, and the pilot, observing that he was still at this height, decided that he had sufficient room for a spiral glide. At the point A, in the diagram, he closed the throttle without switching off (which kept the engine just turning) and immediately proceeded to glide round down wind. At the point B, having completed a half spiral, Parke thought the machine was in an unnecessarily steep attitude, and was insufficiently banked for the turn he was making. He therefore elevated, and believes that he may also have given a momentary touch to the warp, which two operations were for the purpose of reducing the steepness of the descent and increasing the bank respectively.

The machine at once started a spiral nose-dive.

At the point C, Parke opened the throttle full out, in the hope that the propeller might pull the nose up, for he was aware (and had also confirmed the fact during this flight) that the machine was slightly nose-heavy with the throttle closed. The engine responded instantly, but failed to produce the desired effect on the machine; it may or may not have accelerated the descent, but the fall was already so rapid that the maximum engine speed was unlikely even to be equal to it.

Also at the point C, he drew the elevator lever hard back against his chest and put the rudder hard over to the left with his foot so as to turn the machine inwards, this latter being the principle of action that is accepted as proper in cases of incipient side-slip, and, therefore, naturally to be tried in an emergency such as this. The warp was normal, i.e., balanced with the control wheel neutral. These operations failed utterly to improve the conditions.

From C to D the machine was completely out of control, diving headlong at such a steep angle that all spectators described it as *vertical* and stood, horror stricken, waiting for the end. According to Parke, the angle was very steep, but certainly not vertical; he noticed no particular strain on his legs, with which he still kept the rudder about half over to the left (about as much as is ordinarily used for a turn), nor on his chest, across which he was strapped by a wide belt to his seat. His right hand he had already removed from the control wheel in order to steady himself by grasping the body strut forming an upright between the windows of the enclosed body. This he did, not for support against the steepness of the descent, but because he felt himself being thrown outwards by the spiral motion of the machine, which he describes as "violent." The absence of pressure on the legs and arms appears to me, however, to be evidence that the machine was falling as fast as the pilot, who was, therefore, unstable on his seat, and without a fulcrum until he fastened himself to the framework by the grip of his hand.

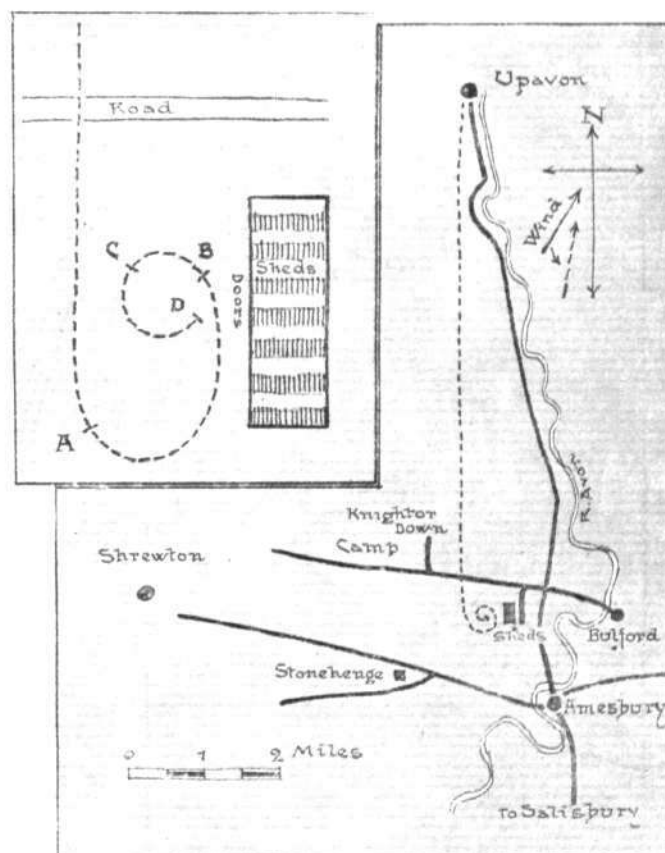
It was his recognition, through this forcible effect, of the predominating influence of the spiral motion, as distinct from the dive, that caused him to ease off the rudder and finally push it *hard over to the right* (i.e., to turn machine outwards from the circle), as a last resource, when about 50 feet from the ground.

Instantly, but without any jerkiness, the machine straightened and flattened out—came at once under control and, without sinking appreciably, flew off in perfect attitude. Parke made a circuit of the sheds in order to get into position for landing in a good place up wind, and proceeded to alight in the usual way without the least mishap. Thus did he and his observer, who, having no belt and rather cramped accommodation, was thrown up against the front wall of the cabin, escape at the last moment from what looked like certain death and effect a perfect landing with the machine none the worse for its severe straining save for a slight stretching of some of the lift-wires under the main planes.

Like the majority, I was at breakfast when the dive occurred; for, having watched the Avro during the earlier part of its flight and up to the end of its second hour, its uniform behaviour inspired a confidence that one was not loathe to translate into an excuse for leave. Very soon afterwards, however, I saw Lieut. Parke on the field, and, together with G. de Havilland and F. Short, of the R.A.F., adjourned to the competitors' mess, where we held an informal, but extremely close, enquiry into the whole affair. It was so obvious to all that the problems of the accident were so near to having to be discussed under the shadow of the pilot's absence, that the opportunity of recording on the spot the essential facts and impressions as he understood them was not only unique, but of the utmost consequence to aviation. His own anxiety to facilitate this work for the benefit of others, and the fact that he retained his presence of mind from first to last in the emergency—although admittedly terribly alarmed—so that he was conscious of each operation and the effect produced serves to give to the aviation world at least one definite experience of an extreme character for its guidance.

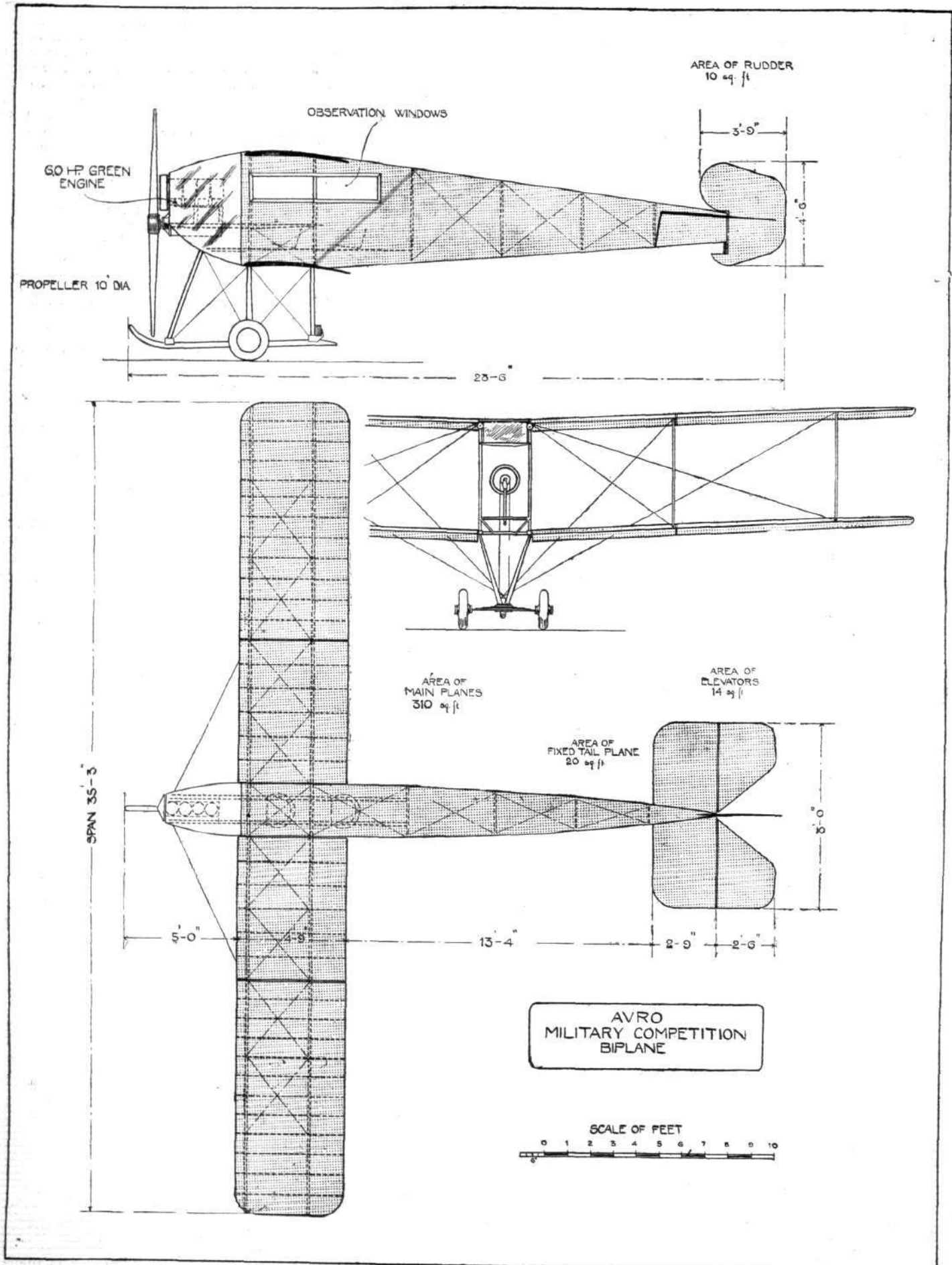
The seriousness of the situation there is no denying. Parke himself stared death in the face; most of the spectators sickened for the crash, and among them were those who were also furious in the belief that he had attempted a "stunt" and failed. There was some reason for this belief, because the machine behaved throughout in a perfectly smooth, normal manner, despite its extremely exaggerated attitude, and when it flattened out so nicely at the last moment even those who had been convinced they were witnessing an accident were left in doubt, whether, after all, it had not been intentional.

If disaster had followed, all manner of "explanations" would have been forthcoming, and, among them, de Havilland would have given it as his opinion that the control had become jammed, having regard to the fact that there was no excuse otherwise for a pilot of such experience to get himself into that position. With this latter observation Parke himself heartily agrees; but it happened all the same. He was not tired after his flight, but he was naturally pleased at its successful termination after all the previous misfortunes that the Avro firm had borne in such good spirit, and had in mind merely the finishing of the flight safely, but in good style.



"Flight" Copyright.

Key map illustrating the flight of the Avro biplane which terminated in the spiral dive. Inset on a larger scale is a lettered diagram of the dive to which reference is made in the text.

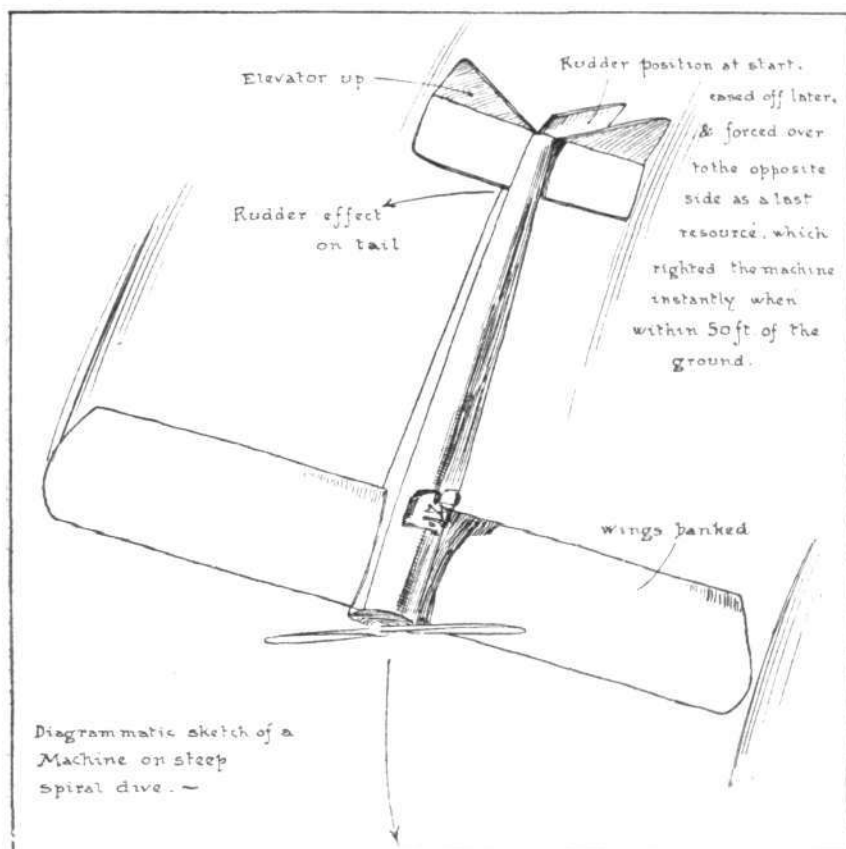


THE AVRO MILITARY BIPLANE.—Plan and Elevation to Scale.

Of the many important and interesting aspects of the case, one is obviously related to the value of flying high. But for the room available for the fall, disaster was unavoidable. For the first 100 ft. the descent was normal, but, afterwards, acceleration to something in the order of 90 m.p.h. (speed suggested by de Havilland) took place, and the machine fell about 450 ft. whilst more or less out of control—which is a lesson those who have not yet learnt would do well to bear in mind.

The next and most important point is that affecting the popular discussion on the proper method of recovering from side-slip in the air, particularly with reference to ruddering inwards and ruddering outwards in emergency. In the first place it is necessary to differentiate between the present circumstances and a side-slip in the incipient stage as ordinarily understood. A side-slip (which means the machine slips inwards), is caused, fundamentally, by over banking, insufficient speed and a *cabré* attitude (tail down), may be incidental to the occurrence. Ruddering inwards in such an emergency, brings the machine on to its accidental line of motion in a flying attitude (instead of sideways), and promotes a dive, from which the pilot obtains both the position and the velocity necessary to recovery.

In Parke's dive, the machine was not side slipping in the above sense (even supposing that the term could properly be applied to any phase of the occurrence) when ruddering outwards proved so marvellously effective. It was flying on a true helix of an excessively steep pitch, and to obtain a proper understanding of the effects produced it is necessary to have a clear mental picture of the tail in its line of flight. It is illustrated diagrammatically in the sketch. The elevator is hard up and the rudder hard over to the pilot's left. In common with the rest of the machine the tail as a whole has a spiral motion downwards through space, but leans inwards somewhat towards the centre of the vertical path in such a way as might produce a side-slip if the machine lacked velocity.



"Flight" Copyright.

The above sketch was drawn from a paper model of a monoplane, as it is exceedingly difficult to convey an impression of a spiral path and banking in one view, and at the same time to show the position of the controls. In Parke's dive, the machine was an Avro tractor biplane. The elevator was hard up, and the rudder hard over to the pilot's left at first and eased off half way later. As a last resource, within 50 ft. of the ground the pilot ruddered hard over in the opposite direction, *i.e.*, outwards, which instantly brought the machine on to a level keel and in lateral trim. The engine was working on open throttle all the time and the warp was normal. The pilot had one hand only on the control (the other being placed on the body strut to steady himself), which was drawn right back against his chest to elevate, and although he could have warped by turning the wheel with one hand, he did not consciously do so.

The present position of the rudder (to the pilot's left) supports the tail, and as the speed increases tends to make it chase round outwards after the nose of the machine, thus turning the machine still more about its vertical pivot, increasing the steepness of the dive, and also, by maintaining the outer wing at its high velocity, accentuating the bank.

By throwing the rudder over to the right, this accentuation of the centrifugal action of the tail is checked, and a virtual acceleration of the inside main wing tip takes place in consequence, so that the machine tends to change its spiral direction of motion into a straight line, and at the same time to recover its lateral trim. These conditions at once release the elevator from the neutralising influences that have rendered it inoperative, and being already hard up it brings the machine on to an even keel at that high speed with extreme rapidity. The warp was not used consciously at this time; the wheel could have been turned with one hand, but Parke thinks he did not do so; *i.e.*, the entire phenomenon is related to elevator and rudder action only.

Such is the gist of the explanation as we argued it on this occasion, and I believe the others who were party to the discussion are in agreement therewith, unless I have misunderstood their meaning on any point. There was a question as to whether the draught off the rudder being directed on to one half of the divided elevator could have exercised an appreciable torque through the backbone of the machine, first to increase the bank and afterwards to reduce it, but there seemed absolutely no evidence one way or the other on the subject. Later, it was suggested that the machine might have made an automatic recovery, such as models do when launched vertically from the hand, but here it seems necessary to remember that a model is in the process of picking up its flying speed, whereas in this case the phenomenon is related to an occurrence that took place when the flying speed had been far exceeded. If it were it would have been a most extraordinary coincidence, for the response of this machine to the right-hand swing of the rudder was instantaneous and indeed with only 50 ft. to go, it would have been quite useless otherwise.

Yes, on the whole I think we may consider it a genuine practical lesson in aeroplane control, and one, moreover, of the most important order. There has been endless discussion on this very subject and much conflicting opinion, but no one is voluntarily going to risk losing control of his machine in mid-air for the sake of demonstrating the facts. Now that it has happened to Lieut. Parke by accident, and he is safely through it to tell the tale, let no one forget the rule to "rudder outwards from a spiral dive that has already acquired a high velocity."

In conclusion, a word to the credit of the Avro biplane and Green engine. That the machine withstood the strain of flattening out at 90 m.p.h., or thereabouts, is no more than any pilot has a right to expect of any machine. Nothing must break in mid-air, and nothing did break. That it recovered in the long run is at least evidence in support of the design. The tail is the same on Parke's machine as on the Avro biplanes supplied to the Army, which are fitted with Gnome engines; but two of those machines have been refitted, by instruction, with larger tails than the designers and pilot consider necessary, although they see no objection to their use. One of the Army Avros still has the original tail.

By the courtesy of the firm, a scale drawing of the machine is reproduced on another page. From this drawing the general lines of the machine and proportions of the surfaces are self-evident. The fuselage or backbone is entirely surfaced and rectangular; its sides narrow to a knife edge at the rudder-post, and present a considerable vertical surface to the wind. It appears, however, that this fin effect is balanced on either side of the vertical pivot about which the machine naturally swings in space, because Lieut. Parke has found no tendency for it to be slewed off its course either into or out of the wind.

This is an important consideration, because the large extent of the surface thus presented by the backbone, which is most easily arranged this way as a natural extension of the cabin-body, was thought to be a possible source of trouble in windy weather. Under normal conditions the machine takes a natural bank when turning; its wings have a large dihedral angle and are quite rigid in the ribs. Equal-sized spars are used.

In winds the machine appears to be very steady and weatherly. A.E.B.

MILITARY AEROPLANE TRIALS AND SOME SIDE ISSUES.

By Our Technical Editor.

Thursday, August 22nd. * Quite the most promising day of the whole period dawned this morning, but it was bitterly cold when the early arrivals tramped across Durrington Down from the camp at Lark Hill, or wended their way up the hill from Amesbury. Cold weather is a detail these days, however, and a fine hour or two not to be criticised by a temperature scale.

Very soon there was activity in the camps of Avro, Bristol, Coventry Ordnance, and British "Dep." all of which contained a machine ready and waiting for a chance to do its three hours' qualifying flight. The Coventry Ordnance with the 100-h.p. Gnome engine was taken up by Raynham, but had to descend after an hour, owing to faulty petrol pressure. Recently, the mechanics have found 75 or so of the lost revolutions that have been delaying matters so long, but even now the machine does not climb to the designer's satisfaction. In this biplane, Mr. Manning, who is still associated with Mr. Howard Wright, has produced a somewhat remarkable type. Its outstanding characteristic is the enormous gap, which enables the fuselage to stand well above the lower plane and yet be well clear of the upper. The upper plane extends considerably beyond the lower, and both have Eiffel No. 8 sections. The elevated position of the upper plane, which must be doing most of the work on this machine, introduces an interesting point to my mind, as to whether its variable resistance (due to changes of attitude) at this distance from the transverse pivot of the machine has any influence on the facility of control.

Constructionally, the rigid undercarriage, which is built close up to the lower plane and is quite devoid of springs other than the very large soft pneumatic tyres, is one of its most interesting and novel features. There are many other minor points of distinct originality in the design, and the construction throughout is characterised by a desire for strength that in some cases seems almost carried to an extreme. The wires, in particular, are very large.

There are two "C.O." machines in the trials, one being fitted with a Chenu engine that has given considerable trouble, and the other with a Gnome, which drives a very large tractor screw by a triple chain. In this model also the pilot and passenger sit side by side, whereas in the other they are in tandem.

At the moment of writing, the Coventry Ordnance machines have not yet succeeded in demonstrating their qualities, and I cannot help feeling extremely sorry for Mr. Manning, whose efforts seem to have been dogged with a persistent misfortune. Trouble with the engine has placed one of the machines altogether out of action, and in the other case the propeller does not really suit the Gnome, which fact would have been discovered long ago but for Mr. Manning's unavoidable absence abroad during the preliminary tests, which were reported to him as being satisfactory. The "tuning-up" of an aeroplane is no easy matter, and the comparative absence of scientific pilots who make a point of studying the qualities of their machines in the air from the designer's point of view, causes the aeronautical engineer's lot to be no light one. There are a few really first-class men, like de Havilland and Gordon England, to whom every flight is a practical lesson in aerodynamics, which they possess the ability not only to comprehend but to teach. The widespread increase of this sort of interest in aviation will do more than anything to make rapid progress in design, and I think much might be done by manufacturers to encourage it, if they all made a point of equipping their machines from the start with an instrument board such as is fitted to BE 2, which can, I believe, now be obtained from Messrs. Elliott Bros., in Leicester Square.

Whether the C.O. can be got into trim before the end of the trials may be a matter of doubt, but what is not a matter of doubt is that the design is worth testing, because it is so very desirable to know what a biplane with X in the neighbourhood of 160 can do. The exact weight of the machine is not available, but it probably flies nearly 2,200 lbs. under trial conditions, which with only 300 sq. ft. and a 110-h.p. is something quite extraordinary for a biplane. In a word, it is a biplane with the monoplane characteristic, and the question arises, what are the merits of the type?

Less pronounced, but in the same category, is the Bristol biplane, which flies about 2,300 lbs. with an area of 387 sq. ft., and also has a 100-h.p. Gnome. Its X is 174, which is also well in the monoplane section, but unfortunately the biplanes in the present trials are so much in the minority that it is difficult to generalise on such small evidence. The M. Farman is a big sail-area machine with X in the order of 80, but the Avro, with X = 138, begins to enter the new realm that is evidently the "promised land" of some designers' minds just now, and there is no doubt that it flies uncommonly well. The repairs having been finished in record time, the Avro was only waiting for an opportunity to make its qualifying

three hours' flight, for which Lieut. Parke (another of those keen pilots with a scientific mind) originally entered in the early morning, but transferred to "after breakfast." It was a vague hour to specify, but, in spite of a very fresh breeze, he lost no time in going aloft, with Capt. W. G. H. Salmond to "observe" him. For two hours he had the air to himself, for it was blowing hard down below, and a small community of "rubber-necks" watched the machine somewhat anxiously round its course. The flying of it was perfect so far as the eye could see, and all were much surprised to see a descent in progress after two-thirds of the allotted time had elapsed. It appeared that the engine had developed a suspicious knock, which made discretion the better part of valour. It was a really good effort, that flight; perhaps the best yet made in the trials, and very sincerely do I hope that nothing further will stand in the way of this machine completing its tests, for the resultant information should be of unrivalled utility. It is of the utmost importance to know how far the big cab-body of this machine is efficient; the backbone into which it is extended has a very large vertical area that seems in no way inimical to its air-worthiness and controllability, while the shelter afforded to the pilot and passenger, who can write down his observations in comfort, is a real acquisition that is not easily overrated in a new art like flight, where so much must always depend on the pilot retaining his full power of control.* It is all very well to fly with the wind and the rain blowing in your face for a little while, and some pilots may feel themselves in closer touch with their element by doing so, but in the long run evolution must surely lead to the total elimination of these distracting factors just as it has done in the motor car, and for this reason it is of the utmost consequence to have reliable data about the one machine that has really been built with this object in view. It is not only that one wants to be in a position to judge of the efficiency and controllability of large stream-line bodies like this, but also to see whether their introduction into the gap has any serious influence on the effective area of the planes beyond the observed dimensions of the obstruction. A point often lost sight of in aerodynamics is that the air velocity in the vicinity of a stream-line body is appreciably slower than the object's rate of travel through the air.

The body of the Avro is built to the full height of the gap between the planes and tapers aft to a vertical knife edge that carries the rudder. Pilot and passenger are completely enclosed and they sit above the level of the bottom planes. Windows in the side walls give a fairly clear outlook owing to the raised position of the seats. The machine is not only well designed but well built and very carefully finished in detail, many of the minor parts, notably the fastenings, showing much cleverness in their arrangement. Very stout stranded cables control the warp from a grooved pulley on the central skid, and the cables, therefore, pass through holes in the bottom plane. The vertical struts have flexible lug fastenings which are also slotted to facilitate quick replacement of a broken strut. A very stout cable (19—16s.), anchored to the toe of the skid and the top of the middle strut, takes the drift and lift, while from the bottom of the same strut two steel lift wires also pass down to the skid. There is 11 ins. dihedral rise on the wings. The engine, a 60-h.p. Green, drives a 10 ft. tractor screw and is fed by enclosed gravity tanks over the pilot's seat. The nose of the body is only 14 ins. wide and the maximum beam only 2 ft. 3 ins. The radiators lie alongside the body and have 600 ft. of $\frac{1}{8}$ in. gilled tubing.

When Gordon England took out the Gnome-engined Bristol biplane before breakfast this morning, a failing engine also brought him to earth again, and while taxi-ing home he buckled a wheel, which, however, was no matter of consequence to the resources of the Bristol sheds. It was some little time, however, before the recalcitrant motor could be coaxed into proper action. The Bristol biplanes, for which, I believe, Gordon England is responsible, are quite as interesting in their construction as the monoplanes, and are built with the same care and attention to detail. In appearance, the covered fuselage projecting midway from the gap is a characteristic feature that easily distinguishes these machines in the air. Two details of greater interest are the undercarriage and the wing struts. The undercarriage consists of a central skid with a leading wheel, it carries a divided axle to the ends of which crutch struts are attached that abut against the body and absorb the shock on rubber springs that give 13 ins. play. There is no wonder, therefore, that these machines seem to float over rough ground. The feature of the wing spars is the manner in which the sockets are

* Little did I realise, when writing this, how soon Lieut. Parke was to need that same assistance, when, on the following Sunday, he kept his presence of mind throughout the headlong dive which is described elsewhere.—A.E.B.

hinged, and the bracing wires are fitted with quick acting release catches so that they can easily be disconnected. When dismantled, the two planes will, therefore, fold together flat, one over the other, without removing the struts at all.

Lieut. Porte put up a first-class flight on the British "Dep.," but sooted up a plug on the 100-h.p. Anzani at about 4,200 ft., so had to come down without finishing his climb. As the necessity of rising to 4,500 ft. is incidental to the performance of the three hours' qualifying flight, it was useless to proceed with the latter, as might have been done with the remaining nine cylinders, and thus a very promising morning, in which three more machines might have qualified, only resulted in further progress by those already well on their way in the trials.

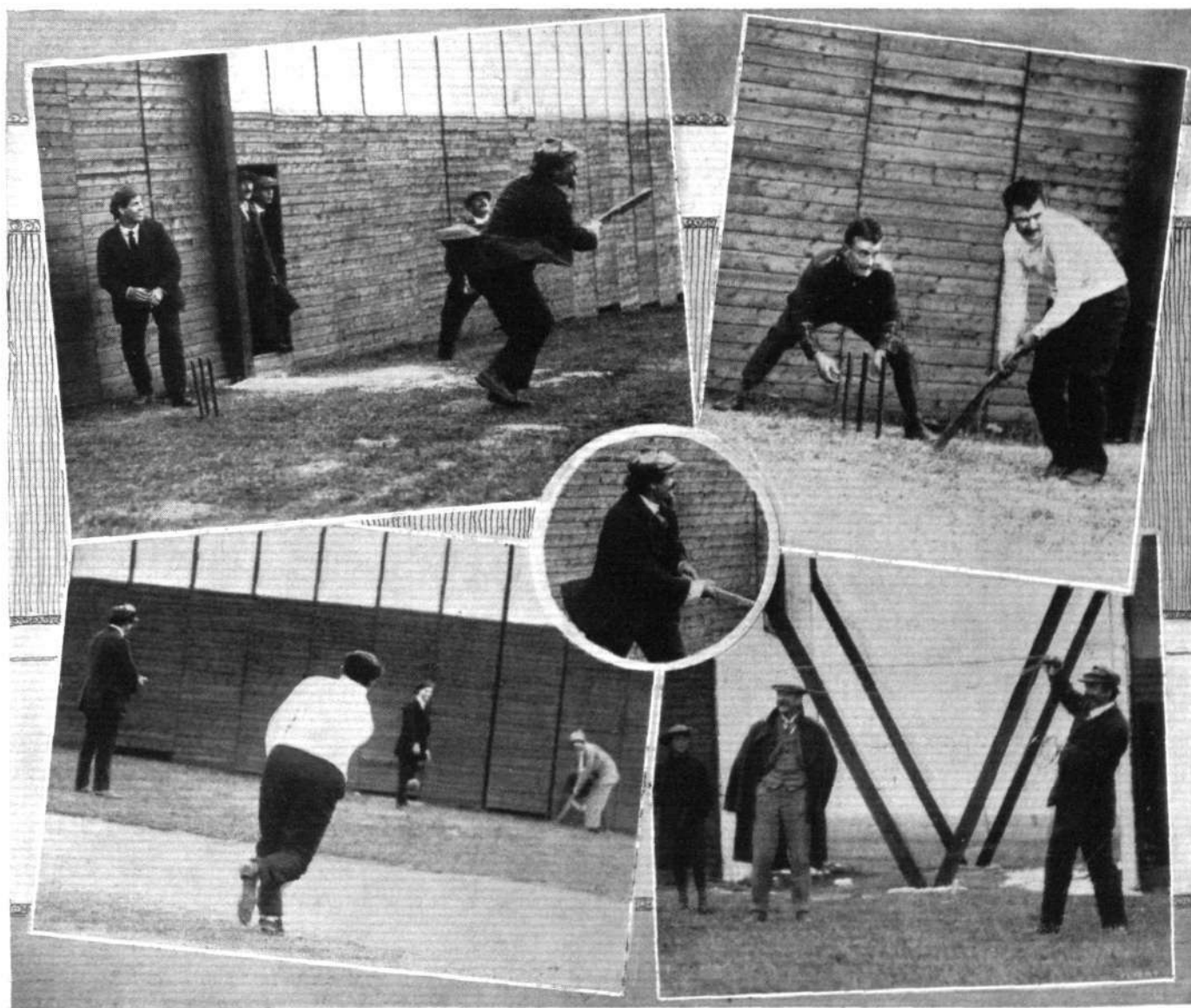
Pixton took the Bristol monoplane over to the plough, but had trouble in rising from the bad ground, and Busted flew over to Knighton Down to have another attempt at speed. The performance of Pixton yesterday, who put up a speed variation of 58—73 m.p.h., was, by all accounts, startling in more ways than one. The process of keeping the machine just "alive" by intermittent switching of the ignition is certainly an interesting and by no means uninteresting performance; whether it may be everybody's joy is another question.

Like the biplanes, the Bristol monoplanes designed by M. Coanda also have a very high value of X, which is in the order of 250, while the loading is nearly 9 lbs. per sq. ft. It is not to be expected, therefore, that these machines should have much reserve power for speed variation or very rapid ascent, since most of the 75-h.p. available must be consumed in flying. On the other

hand, they should naturally be very fast if they are efficiently designed, which there is every reason to believe they are.

To the casual observer what will strike the eye first in these machines are the stream-line casings over the masts, which have exactly the appearance of funnels such as characterise a small torpedo boat. Technically, however, the Bristol monoplane is far too interesting to allow the attention to dwell on such insignificant features. It is one of the few machines with steel wing-spars, and an important point in design is that they abut on each other in a special socket that gives a quick release. Not only is a blow on the wing prevented from crushing the side of the body, but the wings can be removed in a few seconds. The back-bone, a rectangular lattice girder, fabric covered, obtains great transverse strength to resist crushing, from the presence of the foot on the hollow steel mast that bridges the main booms. In the undercarriage, a very clean design of the A frame type, the main struts are exceptionally massive and have a knuckle-socket fastening of original design, which affords detachability, and reduces liability to breakage without destroying the strength. A small magneto worked by a string from the pilot's seat is being tried for starting the Gnome motor.

Just as spectators and officials were moving off to lunch, a sensational landing by Petre, while flying down wind, put the Handley Page monoplane temporarily out of action with a damaged wing. Circumstances over which the pilot apparently had no control forced him to execute this unnautical manoeuvre in the immediate vicinity of the sheds, and regret at the damage to the machine, which is repairable, is tempered by the lucky immunity of the rest, who might not have been so happily situated. Again it seems most



"Flight" Copyright.

Killing time at Salisbury Plain in consequence of the eccentricities of the Clerk of the Weather.—Messrs. Cody, Vedrines and Co. amuse themselves outside the hangars at "cricket" and lassoing. Note the ball in the air, in the lower picture, after Vedrines' delivery.

unfortunate that such an interesting monoplane as the Handley Page should be disabled just when there is a chance of obtaining some reliable information as to its action. Great claims are made for its air-worthiness, and indeed there is much evidence in favour of the crescent-shaped wing with the washed-out tips. Whether the designer's theory of its "stability" is true or not may be open to question, but when I hark back for a moment to the early experiments of José Weiss I can hardly help feeling that some of the most interesting work ever done in this country has most unworthily been forgotten.

Gordon England, who was associated with Weiss in those days, began his practical experience in the air by being pushed over a kind of precipice in a small Weiss glider *without any controls*. Rushing down a slope of 1 in 3 the wind soon caught the little craft, and lifted it a clear 30 ft. into the air, after which it began to drift backwards, while still advancing through the wind. In the course of time, the man-bird settled lightly, away down in the valley. The longest glide ever accomplished in this way lasted 59 secs., the best of many attempts, which were made in the roughest as well as the finest weather. The Weiss craft, once properly balanced, *always* exhibited the utmost stability, and, according to England, it seemed impossible to make them side-slip. Models launched vertically by holding them by one wing-tip would immediately right themselves, and glide properly. Dead birds stiffened with wire would behave similarly, while live birds fitted with paper collars would fly *piqué*, and those fitted with reins to hold the head back took on the *cabré* habit.

Here, then, is some early work that deserves due credit and attention now that the first essentials of aviation have been mastered. The prime characteristic of the Weiss apparatus is the crescent shape of the wings and their variable camber and incidence. Other machines with this peculiarity are the Etrich and the Handley Page, while the Dunne has a V-plan form and a different principle of variable camber. Of special interest in this connection, so it seems to me, is the possibility of reversing the usual order of warp, by *raising* the upturned wing-tip to force *down* the high wing in order to restore balance. An objectionable feature of the standard warp, which tends to become more pronounced with the expanded tips now becoming popular, is the drag it puts on the machine. If the speed of flight is much below the normal, warping the down wing might slew the machine into a nose-dive or promote a side-slip; and this effect may be the cause of some reports by pilots, that their warps have on occasion ceased to be effective.

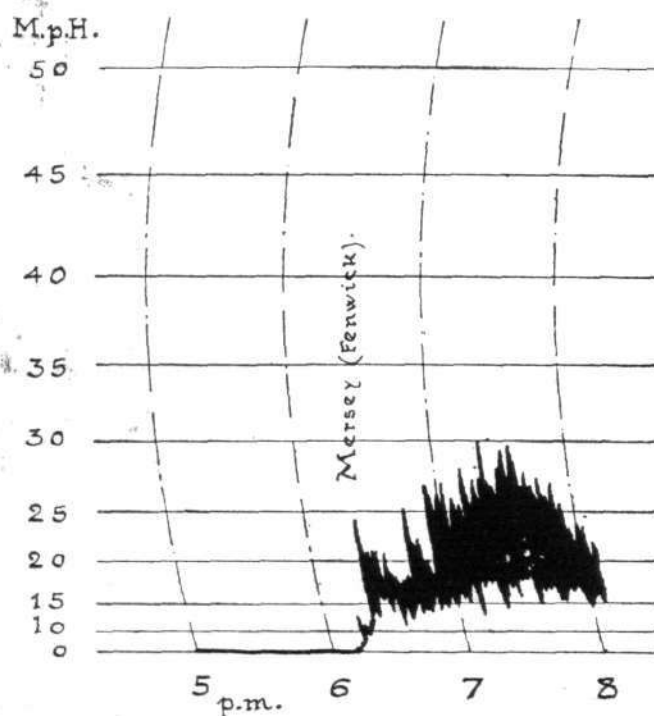
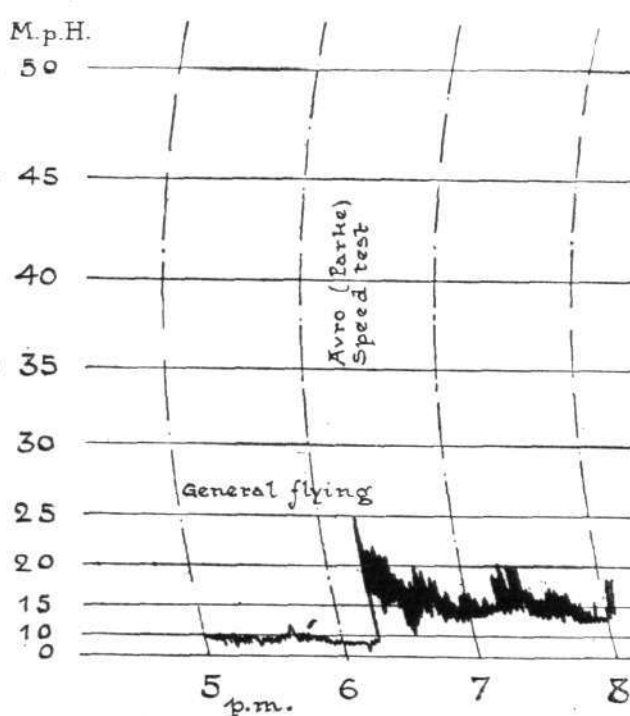
In this connection, the question of momentum seems to me, at

first sight, to be important as affecting the *relative* influence of drift. The mathematics of this sort of problem are apt to be a stumbling-block to quick thinking, but others may care to discuss whether there is or is not any inherent importance in speed *relative to the earth*. In a recent discussion I found myself at variance with others on the point, and in the long run it came to the question as to what is momentum. As a definition, from the aviator's point of view, I suggest "a force that forms a component with gravity." On this hypothesis, a machine that has no speed relative to the earth has no momentum, but there is quite a large number of people who say that it has. In any case it is very important to decide the question, because a machine without momentum, *i.e.*, flying against a wind of its own speed is, according to my view of it, in a fair way to fall if the air could *suddenly* become calm. This is a particularly important aspect of the problem of turning into and out of the wind.

Reverting to the subject of the reversed warp, the forcing down of the raised wing would transfer the extra resistance to that side, and if the warp acted only as a drag the slewing of the machine would increase the velocity of the lower wing-tip and thereby tend to restore equilibrium. Under present conditions, the opposite effect is apt to occur in an emergency.

Two machines finished their transport test to-day, the Maurice Farman and Busted's Bristol monoplane, the latter being a very smart performance. Busted also flew to the plough and had an amusing encounter with the haystacks in the next field while ascending. Harvest beer was consumed in great quantities at the Bell Inn the same evening, by way of compensation, and in consequence. Sippe, taking the Hanriot to the plough made a perfect *atterrisage*, but the drag on the wheels at the last moment brought the machine gently over on to its nose. Both pilot and passenger, Col. Everitt, kept their seats, and very little damage was done to the machine. Among the other pilots who came out for practice, Gordon Bell, who has taken over Vedrines' British Deperdussin, put up a very fine flight, followed by a spiral glide that rivalled the demonstrations of Prevost. Really, Bell is a pilot of the first order, for no machine seems to come amiss to him, and with anything like luck, he should put the British Deperdussin through the trials with flying colours.

During the afternoon, an interesting exhibition was the Blériot transport wagon, a special device, excellently designed, to facilitate the towing of a machine behind either a car, horses, or a gun carriage. Packed on board, and covered with a properly made

 13th August 1912

 24th August 1912.


"Flight" Copyright.

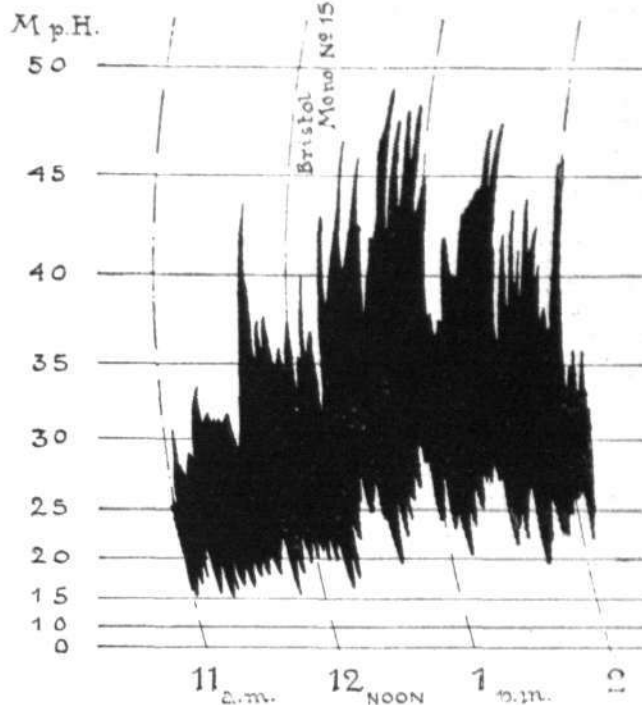
Wind Charts for August 13th and 24th, 1912, as recorded on Salisbury Plain between the hours of 5 and 8 p.m.—In the chart for August 13th is seen the remarkable gust which killed Fenwick on the Mersey monoplane, and on the chart for August 24th will be noticed an almost identical gust at the same time in the evening. General flying was in progress, but, happily, only experienced pilots were aloft. All noticed the change, and the gust struck the Avro biplane while Parke was undergoing his speed tests. Behind the sheds the *remous* were especially noticeable as machines came down through the gap to land up wind.

tarpaulin, the Blériot presented a very workmanlike job of the business of preparing for the road. It will be difficult to find roads wide enough for some machines, it seems to me.

Friday. A wet and windy morning gave the Amesbury camp a very fair excuse for indulging in a little conscious appreciation of the relative advantages of the interior of the George Hotel, and the inside of a tent. When one goes to bed at midnight after a discussion on "momentum in air" and really does get up at four the next morning, all the world seems grey and one's lot in life no better than that of the Lark Hill contingent who keep company under canvas with those interesting but undesirable denizens of the earth's cuticle that have a habit of taking the air when it is wet. Wet or fine, however, the conscientious but unimaginative night watchman at the "George" hammers at your bedroom door, and having thoroughly aroused everyone in the house goes on his way rejoicing, while the sleepy occupants of comfortable beds blink confidently at the trees in the garden and succeed by natural lack of optical focus and the aid of a much warped pane of window glass to convince themselves that the leaves are moving vigorously or at any rate sufficiently to betray a dangerous wind to be blowing on Durrington Down. And as a rule it is these days, although never has such weather been seen on Salisbury Plain before. In the memory of man, I imagine, there has never been such an August anywhere, and that it should have occurred on an official aviation meeting, of all events, is nothing short of the height of irony. Nevertheless, it has afforded a wonderful opportunity for those who have cared to take it, and I am more than pleased to cancel my impression of the opening week, viz., that there was too much desire in some sheds to score marks rather than demonstrate the weatherliness of machines. Since then, the flying has been much more enterprising, and although the weather has been beyond the limit, every machine of note in these trials has put up some wind test very much to its credit, and a fair amount of difficult flying besides.

Yesterday it was the flight of the Avro, to-day it is Pixton on the Bristol monoplane who has set tongues wagging. Just about noon, when everyone was weary of waiting for lunch, and the wind-gauge was steadily working itself into a kind of fit, Pixton and Capt. Hamilton suddenly surprised the very limited field by going up in No. 15. For a quarter of an hour Pixton fought the gusts, which ranged from 17 m.p.h. to 47 m.p.h. in velocity, and thus had a V^2 intensity of 290 to 2,200, or $7\frac{1}{2}$ to 1. It is not a steady wind that a pilot fears, but gustiness, and there was certainly enough of that on this occasion. Just after landing, the wind-gauge registered 50 miles an hour, so there was no question of the conditions quieting down when the machine had once got into the air. Capt. Hamilton, who, as the pilot of the Army Dep.—which, I understand, has now

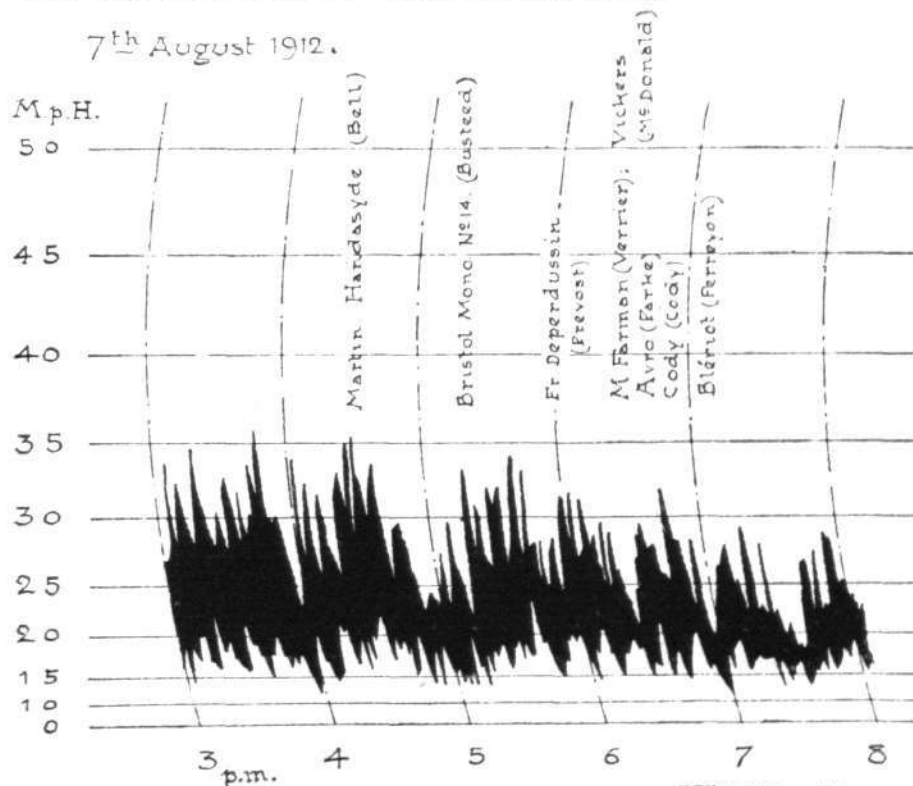
23rd August 1912



"Flight" Copyright.

Wind chart for August 23rd between the hours of 11 a.m. and 2 p.m. At noon Pixton took the Bristol monoplane, No. 15, out for a flight, with Capt. Hamilton, of the Royal Flying Corps, as a passenger, and stayed aloft for 15 mins. As a wind test, it may well be regarded as a record.

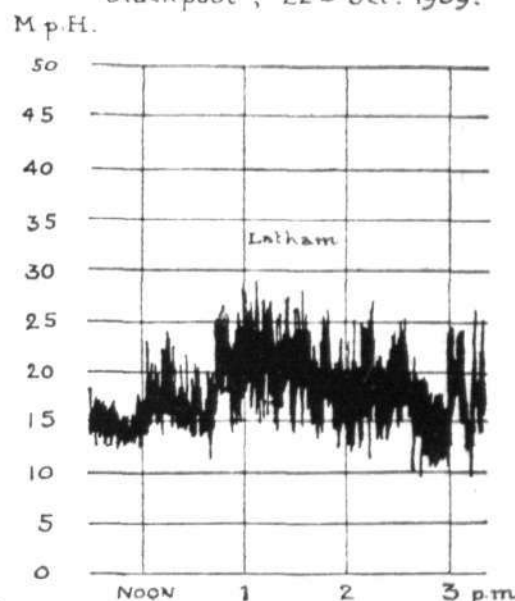
7th August 1912.



"Flight" Copyright.

Wind chart for August 7th on Salisbury Plain between the hours of 3 and 8 p.m., showing the period when most of the machines in the Military Trials did their wind test.

Blackpool, 22nd Oct. 1909.



"Flight" Copyright.

Wind chart for October 22nd, 1909, at Blackpool, when Latham made his famous flight, which then and for long afterwards stood as the pinnacle of skill and daring on the part of the pilot, and of weatherliness on the part of the Antoinette monoplane. At Salisbury Plain on August 7th Bell flew the Martin-Handasyde, which is a machine of the Antoinette type, under very similar weather conditions.

been purchased from him by the War Office—is qualified to judge of the conditions, and with the machine's performance he was undoubtedly most favourably impressed. To begin with, he showed no mean confidence in both man and aeroplane when he undertook the journey, for no one who drives any vehicle really cares about riding as a passenger, and an occasion of this sort was certainly quite out of the ordinary. The machine behaved splendidly, and it must have been in excellent trim, for the gusts jerked the control out of Pixton's hands on many occasions. This may sound alarming, but on a good machine an automatic warp seems to give the effect of a flexible wing and apparently tends to promote steadiness; at any rate, the lithering of the warp-lever in gusty weather is frequently regarded as a favourable sign by pilots of experience.

Saturday. Quite one of the wettest mornings on record cleared at noon, and gave place to the finest afternoon that has been seen this month. The sun shone! and it really became quite hot!! In patient expectation I waited on Knighton Down by the speed-course for the machines to flock over for their trials. According to the weather-chart, we were evidently entering the centre of the cyclonic region of this phenomenal atmospheric disturbance; the calm foreboded evil to come, and all the more reason therefore to make haste. Shortly after lunch, de Havilland flew up on BE 2, to try his slow speed, which he recorded at 40 m.p.h. in a reasonably steady flight. His fast speed is 70 m.p.h., an increase of 75 per cent. Truly it is a remarkable machine. And then much valuable time was wasted until Porte came over with the British Dep. No. 20; but, having started on his fast flight, he came down on the course with a faulty magneto. To his assistance went de Havilland on BE 2, and afterwards flying off to the sheds with a message, he called up reinforcements long before they would otherwise have been available. By this time, General Henderson had driven over by air in the Maurice Farman, which has so impressed everyone with its slow-speed safety and ease of flight; also other officials had assembled, in the hope of seeing some really business-like work. Time passed and nothing happened, until a message arrived to say that a much expected pilot had gone to tea!

During the evening, the Avro, which had been delayed by a broken oil pipe, put up a fast speed of 59.9 m.p.h., but Parke decided that if the propeller were changed he could provide a much better result. The other British Dep. No. 21 was also put through a speed test by Bell, who had flown the 100-h.p. Dep. from the Central Flying School at Upavon, whither he had been to take his "certificate" for the Royal Flying Corps. He is going to fly the 100-h.p. Hanriot in the Army manoeuvres. By the time he had gone four times over the course, and averaged 66.5 m.p.h., the wind had risen to an irregular gustiness that made slow speed work a questionable undertaking on a comparatively unfamiliar machine, for it must be remembered that Bell has only just taken charge of Vedrines' mount. And so finished, from the official point of view, the best day of the trials, the net result of which was, virtually, no more than that the Blériot sociable No. 5 completed its transport test! It was an opportunity sadly wasted by some of the manufacturers, who have had so many hours of enforced occupation of their sheds in which to get ready.

There was much joy riding, however, in front of the sheds, and Cody made several "special turns." An interesting arrival, too, was the Dunne biplane, which was flown by Capt. Carden, and also the Dunne monoplane. The Dunne biplane is quite a novel sight in the air, and if observed unawares while slowly turning towards you is likely to produce a shock from which it takes minutes to recover. When I first saw it in this position I thought at first it was the Maurice Farman trying to stand still in the air. It seemed to be trying to climb at an angle of about 45 degrees, and was quite stationary. In agonised expectation of a horrible backward slide, it flashed through my brain that Verrier, who is rather fond of playing about on the M.F., had suddenly gone mad; and then, slowly, the machine changed its shape in the air, and I discovered it was the Dunne turning towards me on a full natural bank. The difficulty of judging the precise attitude and direction of flight of a machine in flight, especially a biplane, is well known, and I must confess I was terribly relieved when I discovered my mistake. Apparently, the Dunne biplane naturally, slowly, and with the utmost steadiness, banks over to quite a steep angle when turning, for I saw Capt. Carden, who was flying it, do the same thing in an equally pronounced manner a few seconds later as he turned up wind to land.

The Dunne biplane is sufficiently well known to most readers of FLIGHT to need no introduction, but for others it must suffice to explain that it has its planes in V plan form, and each wing has a peculiar variable camber from root to tip (formed by generating the surface on a cone), from which it is expected to derive an especially high degree of "automatic stability." Since his monoplane was finished, Dunne had the misfortune to lose his pilot in a motor cycle accident, and his own severe illness has also much hindered progress. His desire to ignore the limitations of a weak heart and his doctor's

advice by going into the air himself to prove the merits of his own design, is a worthy foolishness that is a constant alarm to his friends, and especially to Miss Dunne, who has been a real partner in all her brother's efforts and misfortunes. Already, Capt. Carden has taken his "ticket" on the Dunne biplane, so progressive flying with that machine is only a matter of time.

Sunday. Under the circumstances, it was only reasonable that the officials should have acceded to a couple of special requests from Bell and Parke that they might make their three hours' flight this morning, provided the weather was fine and that they could secure the services of observers. Sunday is not an official day, but the condition of the weather has come to such a pass that it is a case of using every available moment for doing business. Accordingly, the morning being fine, Parke in the Avro biplane ascended with Lieut. Le Breton at four minutes past six, while Bell took up his British Dep. about an hour later. After a period of interested watching, the flying became monotonous, more especially as the pilots on the three-hours test have a very natural habit of going out of sight. It is very tiresome work going round and round the same course, and although they keep to the letter of the regulations by including the turning points within the compass of their circuit, they make an occasional excursion further afield for a change. Everything seemed to be going so smoothly, in fact, that there was no reason to delay breakfast any longer, for which reason many of us were absent when perhaps the most remarkable experience that any aviator has survived to remember befell Parke on the Avro machine. He had finished his three hours, and was naturally pleased at having thus brought successfully to a conclusion the test that is, in some measure, the hardest of all. While making a spiral glide in front of the sheds from an altitude of 600 ft. or more, he lost control of the machine and fell headlong to within 50 ft. of the ground. Everyone thought that he would be killed for a certainty, but at the last moment he made a wonderful recovery; the machine flattened out and flew off round the sheds just as if the pilot had brought off a startling "stunt." As a fact, however, the machine was entirely out of control, as will be seen from the account of the accident that is given elsewhere, which is based on a personal discussion with Lieut. Parke and some eye witnesses, which took place this morning. The information brought to light is of the utmost consequence, because it establishes the exact facts of what happened in a real emergency, which would have been quite impossible had the end been as disastrous as at one time seemed certain. The recovery was brought about by ruddering violently outwards as a last resource, the machine then flying towards the earth at perhaps 90 m.p.h. or so on a very steep spiral path. The elevator was hard up, but had no effect whatever until the rudder was put over to the right, when the response was instantaneous. The conclusion as to outward-ruddering from a spiral *vol piqué* that has already attained high velocity—whereas an incipient side-slip at slow speed, which generally begins such an unintentional spiral, is corrected by ruddering inwards, in order to gain velocity—and the importance of flying high, so as to have room for the manoeuvre, should be engraven very deeply in the minds of all pilots henceforth.

The Avro and the British Dep. No. 21, having completed their three-hours' test, ought to have no difficulty in getting through the rest of the trials on the first opportunity that the weather affords them. Perhaps the other British Dep., driven by Lieut. Porte, may also get through, but it has been so much delayed by engine trouble that the result is doubtful. A new wing has arrived for the Handley Page monoplane, but time is likely to press hard on this competitor, as on the Martin-Handasyde, which has been in dock all this time while the owners have been virtually rebuilding their Chenu engine. The Chenu engine on both the Martin-Handasyde and Coventry Ordnance aeroplanes have had their magneto driving gear dismantled and redesigned completely; indeed, the magneto in both cases is now turned at right angles to its former position. The Coventry Ordnance Chenu also broke both lugs off one of the supporting brackets, and as the surfaces formerly in contact show no sign of a metallic fracture it would look as if the lugs had been stuck on in some manner to the rest of the casting. Now is the time for makers of British engines to come to the fore and gain the British market for themselves. The field is already reasonably wide and will increase enormously in the future. Reliability is the main consideration, and as someone remarked quite recently, a first-class British aeroplane engine that would develop 100-h.p., and go on doing it, ought to be worth "half a million to the firm that makes it." As a matter of fact, there is probably no need for an engine to be quite as powerful as this in order to have a sufficiently wide field, but, in any case, a 100-h.p. motor of British make is certainly wanted. Absolute reliability is the first and last consideration. The weight should be reasonable, like the price, but there are very few aeroplane manufacturers at the present time who would quibble about a rather high figure for either if they could be really certain of getting what they are told to expect.

This evening Cody took Major Sykes for a climb, and improved considerably on his previous rate of ascent. Afterwards Major Sykes went for a passenger flight with Perreyon on the Blériot, as also did Gen. Henderson. As far as possible, Gen. Henderson and Major Sykes are making a point of gaining personal experience in the passenger seats of all the machines that have finished their tests, but they have both very properly refused to be taken round joy-riding on any aeroplane that has not yet satisfied the trial conditions. Both Hanriots and the Bristol monoplane No. 14 were also flying.

Monday. The weather again. Let me say no more of it. It stopped all flying, and itself has ceased to be worthy of comment.

THE TRIALS OFFICIALLY ENDED.

Tuesday. Except for a brief period about lunch time, the day has been excellent for flying, and, under the circumstances, it was not altogether unexpected when competitors were officially notified

OUR TABLE AND ITS LESSON.

THE transference of the weighbridge from the open air to one of the vacated sheds has enabled a very extensive revision of the weights of the machines to be made in our table, and has, incidentally, opened the eyes of several manufacturers to the fact that two and two makes *more* than four when assembled as a machine entire. Makers' estimates were, of course, based on calculated weights of individual parts, but even when these parts themselves are actually weighed, the machine as a whole generally weighs far more than their sum. It has, indeed, sometimes been found that the machine is as much as four or five hundred pounds heavier than the stated weight.

In order to know what a machine is doing it is essential to know its weight fairly accurately, and, in any case, it is only when the weights and areas are accurate, and the actual horse-power of the engine is known, that the values of X begin to take on any numerical significance. Our table this week has again been brought up to date and revised, and so much of it as relates to the machines that have either completed or are well on their way through the tests can be taken as accurate. The analysis of the figures presents as much difficulty as their compilation, but as they are mere dead letter records, when presented without an interpretation, it behoves us to see if we cannot bring them into some semblance of life both by appreciating the performances already accomplished and by passing a few remarks about the machines that have not yet undergone their tests.

For this purpose it will be more convenient to discuss each machine separately thus:

Hanriot.—Both machines have been built to within six pounds of the same weight and have performed equally well throughout. They have scored especially on speed and climbing, and the No. 1 made a particularly good glide. The speed range put up by No. 2 may be regarded as abnormal for its type, having been obtained by periodically switching off the engine. In these trials, the Hanriot may be regarded as a standard of overall efficiency, which is in the order of at least 80 per cent. at full speed, as ascertained by the ratio of the gliding resistance multiplied by the maximum flight speed to the horse-power available. The Gnome engines on these machines have been somewhat extravagant in fuel and oil. The value of X is about 150, resulting from a moderate load per h.p. = 24 and a high loading = 6.4 lbs./square foot. $\epsilon = 80$ per cent.

Deperdussin.—The French Deperdussin, which alone of the Dep. team as yet has finished its trials, is a slower speed machine than the Hanriot, but virtually of the same overall efficiency both on speed and on speed with climb added. With these performances equated to fuel consumed, instead of engine power, the French Dep. scores considerably. The value of X is about 140, the machine being slightly lighter, and the effective area, including the lifting-tail, slightly larger than the Hanriot. In the Table E, the position of the Dep. indicates a good speed for its design, which is also supported by the efficiency results. It may almost be regarded as a large-area monoplane, when the lifting-tail plane is added to the wings to produce a total of 320 sq. ft. $\epsilon = 72$ per cent.

Blériot.—The sociable and the tandem stay curiously together in the results of nearly all the calculations, and score most when the useful weight carried, i.e., 350 lbs. on each machine, is the basis of comparison. Also they maintain their good position under this head when fuel consumption is substituted for horse-power. The value of X for the tandem is 147, while for the sociable it is 118, the latter having a lower loading on the wings, which materialises as an increased speed range. The very high range actually obtained resulted from throttling down below the safe limit for an ordinary pilot, but it was the throttle and not the ignition that was used and there is no doubt that the range of this machine is superior to that of the other. Both might be made a little faster for the power available if the gliding angle could be improved to one in six. Probably the landing chassis, which absorb 13-inch obstacles, is

that the trial would close at 8 o'clock this evening. Before breakfast, Sippe on the Hanriot and Busteed on the Bristol monoplane both flew over to the plough, but did not seem very well pleased with their efforts to ascend therefrom. Bell, on the British Dep. 21, which he is trying to push through the trials like a rocket, flew over to Knighton Down for the speed test and glide, but the figures are not yet available. Parke on the Avro biplane did likewise. In the afternoon Bell underwent transport and again Parke did likewise, the dismantling and re-assembling of the Avro biplane being a marvel of rapidity. Porte, on the other British Dep., who went for speed and glide in the morning buckled a wheel on landing, and the machine, turning tail up in the air, succeeded in damaging its under-carriage, which was something of a climax to a series of misfortunes. The Martin-Handasyde has been disappointed in its engine again. This time the gear reduction of the propeller drive having given trouble.

accountable for considerable head resistance. $\epsilon = 81$ per cent.; 65 per cent.

Bristol.—The monoplanes are characterised by an exceedingly high value of X, which is about 220, but the machine as such shows a high speed efficiency of 80 per cent. The trial conditions, however, hardly support a monoplane with an X of this order, the climbing being only just up to the 200 ft. a minute and the speed range being deficient except when obtained by Pixton's method of switching on and off the engine. The extra high value of X results from an unduly high loading, which might be corrected by larger wings or reducing the weight. If 200 lbs. can be taken off the weight of the machine so that it flies under trial conditions at about 1,650 lbs. loaded, the X would be reduced to 173, which is still a high value. As the weight per horse-power is then down to 22, any further change in design would presumably be in the direction of increased wing area. $\epsilon = 111$ per cent.; 123 per cent.

Cody.—Among the biplanes the Cody has put up a quite extraordinary performance, remarkable alike for its high speed, its speed range, very fair rate of climbing, good gliding angle and very considerable efficiency on a fuel basis. It is uncertain whether the 120-h.p. Austro-Daimler engine with which this machine is fitted gives more power than its stated value, but the value of X is 131 on the present assumption, which seems to make it doubtful whether it really has much more reserve power available for climbing than the 19 per cent. already demonstrated during its ascent for the three hours' flight. The fact that its overall fuel speed efficiency is so very much better than its efficiency on the rated power may be entirely accounted for by its very economical oil consumption, but if it is not, then I would suggest that the rated value of the engine is not seriously below the power it has been developing. With a capacity for carrying a very heavy load, the Cody does not show up as a very efficient vehicle of transport for a limit of 350 lbs. useful weight, but even so it does very well on a fuel basis. Allowing for speed range, as was done in last week's comment, its position is much improved. In a word, there is no doubt that Cody has made good with his "cathedral." $\epsilon = 65$ per cent.

By the way, everyone may not know that this term, which is popularly supposed to relate to the large size of the machine, in reality originated from a very clever *bon mot* by Lanchester. In the days when everyone was discussing the virtues of the upward dihedral angle (which characterises many of the machines in the military trials) Cody was pointing out that his planes were not dihedral, but arched, on the principle of the gull's wing. "Yes, I see," said Lanchester, "you've got a cat (Gr. kata = down) hedral."

Avro.—The Avro biplane having been delayed by the accident, has not progressed with its trials sufficiently to provide all the data required, but the fact that it has sustained a somersault on the ground and recovered from a spiral *vol piqué*, adds interest to the attention that the design itself had already attracted as representing the natural evolution of the principle of protection for pilot and passenger by providing them with proper cabin accommodation. At present it is flying with X=144, which is a very high value for a biplane, but having regard to the fact that the wings are only reasonably loaded, it is presumably a more powerful engine that is required to fully meet the trial conditions. As a matter of fact the 60-h.p. Green on this machine is running very heavily loaded (27 lbs. per h.p.), and although performing excellently is likely to have more than it can manage in the climb. On fuel efficiency it is already showing remarkably good results, primarily on account of the high compression which reduces its fuel consumption per h.p. hour 30 or 40 per cent. below the average aeroplane engine. So far as it has gone, the machine appears to be a very successful exhibition of the designer's objects, which, being original and directed along practical lines are, therefore, deserving of the utmost credit. $\epsilon = 87$ per cent.

MILITARY AEROPLANE TRIALS. PROVISIONAL RESULTS UP TO AUGUST 27th.

[In all calculations the corrected h.p. is used instead of the maker's h.p. when there is any difference.]

No.	Name.	h.p.	Motor.	Pilot.	Corrected h.p.	Cu. ins. per h.p.	Weight.		Weight + h.p.	Area.	Weight ÷ area.	$X = \left(\frac{W}{H.P.} \times A \right)$	Petrol.		Oil, per hr.	Petrol + oil.	Ratio. Petrol : oil.	Climb 1,000 ft.	Speed.			Stop on grass.	Stop on plough.	Rise from harrow.	Wind.		Gliding.			Power.		With climb added.	Transport.						
							Empty.	In flight.					Per hr.	Per h.p. hr.					H.	Fast.	Slow.				Increase.	Maximum.	Minimum.	Slope.	Thrust.	Speed.	TV : h.p.		V : F.	Dismantle.	Re-assemble.	Finished.			
					HP.		lbs.	lbs.	sq. ft.	X		gals.	pts.	gals.	F		ft./min.	h.p.	H%	V	%		yds.	yds.	yds.	m.p.h.	m.p.h.	One in	T lbs.	TV m.p.h.	E ₁ h.p.	E ₂ %	E ₃ %	min.	min.	men.	Aug.		
1	Hanriot	100	Gnome	Bielovucic	80	12'0	1166	1921	24'0	300	6'4	153	8'0	72	2'4	10'4	3'3	364	21'2	26'5	75'2	59'9	25'6	120	124	206	31	21	6'6	291	61	58'4	73'0	70	99'5	13	18	5	17
2	Hanriot	100	Gnome	Sippe	80	12'0	1160	1898	23'7	300	6'34	151	8'65	78	2'1	10'75	4'2	333	19'2	24'0	75'4	66'6	13'2	119	—	—	31	25	5'9	322	68	65'0	81'5	77	105'5	—	—	—	27
4	Blériot Tan.	70	Gnome	Perreyon	60	11'3	885	1499	25'0	260	5'77	147	5'35	61	1'7	7'05	3'15	250	10'6	17'7	61'1	52'0	17'5	60	138	250	28	15	5'6	267	—	43'5	72'5	77	90'2	17	27	4	12
5	Blériot Soc.	70	Gnome	Perreyon	60	11'3	857	1481	24'7	310	4'8	118	6'3	72	1'7	7'02	3'77	235	9'9	16'6	58'9	40'0	47'3	45	—	—	30	26	5'3	280	52	44'0	73'5	78	90'1	28	50	3	24
7	Avro	60	Green	Parke	65	8'4	1191	1762	27'2	335	5'28	144	4'03	495	5	4'53	8'1	105	5'6	8'6	61'8	49'3	25'4	47	46	—	33	16	6'5	270	—	44'6	69'0	123	77'0	12	11	6	27
14	Bristol Mon.	80	Gnome	Busteed	75	9'6	1144	1839	24'5	210	8'75	214	8'0	85	1'7	9'7	4'7	200	11'2	14'9	70'5	68'3	3'2	65	104	—	31	15	6'5	284	64'3	60'5	81'0	78	95'9	—	—	—	—
15	Bristol Mon.	80	Gnome	Pixton	75	9'6	1159	1871	25'0	210	8'9	222	—	—	—	—	—	191	—	—	73'0	58'0	26'0	110	—	—	44	17	—	—	—	—	—	—	—	—	—	—	
17	Martin H.	75	Chenu	Bell	95	6'9	1671	—	—	310	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
21	Brit. Dep.	100	Gnome	Bell	80	12'0	1226	2037	25'4	270	7'5	191	9'8	79	1'83	11'65	5'5	267	16'5	20'6	68'0	54'6	26'0	—	40	200	—	—	6'2	328	—	60'0	75'0	64	96'0	60	54	4	27
22	M. Farman	70	Renault	Verrier	72	5'9	1318	1931	26'8	666	2'9	78	7'0	78	7'3	7'73	9'75	207	12'1	16'8	55'2	37'4	47'6	64	33	140	29	14	6'8	284	38'0	41'7	58'0	68	74'8	78	108	4	22
26	French Dep.	100	Gnome	Prevost	80	12'0	1184	1868	23'4	320	5'85	137	8'4	75	1'3	9'3	6'3	333	18'8	23'5	69'1	59'0	17'1	73	34	132	29	13	5'4	346	62'0	64'0	79'2	86	102'7	53	51	4	10
31	Cody Bi.	120	A.-D.	Cody	—	5'9	1948	2680	23'8	485	5'55	131	9'0	6	42	9'42	21'4	288	23'4	19'5	72'4	48'5	49'4	30	33	320	27	14	6'2	432	59'2	83'2	69'2	110	88'7	21	30	6	23
	BE ₂	70	Renault	de Havilland	72	5'9	—	1700	23'5	375	4'55	106	—	—	—	—	—	365	15'0	20'8	70'0	40'0	75'0	—	—	—	—	—	6'25	272	—	51'0	73'0	—	—	—	—	—	—

N.B.—Engine compression:—Gnome, about 45 lbs. per sq. in.; Green, 90 lbs. per sq. in.; Viale, 64 lbs. per sq. in.

Weights: Only those machines that have their weights empty recorded have been actually weighed; the others are makers' estimates.

SUMMARY.—Machines arranged in relative order; figures for some machines included above arrived too late for this table.

HP. Power.	F. Fuel.	A. Area.	W. Weight.	W ₁ . Weight per h.p.	W ₂ . Loading.	V. Speed.	R. Speed range.	G. Glide.	H. Climb.	H%. WH + HP.	T.V. Speed power. T = W ÷ G.
Actual.	gals. per hr.	sq. ft.	lbs.	lbs./h.p.	lbs./sq. ft.	max. m.p.h.	Increase %	One in	ft./min.	%	h.p.
Cody 120	Avro Bi. 4'53	M. Farman 666	Cody 2680	Avro 27'2	Bristol M. 15 8'9	Hanriot 2 75'4	Cody 49	M. Farman 6'8	Hanriot 1 364	Hanriot 1 26	Cody 83'2
Hanriot 1 } 80	Blériot Soc. 7'02	Cody 485	M. Farman 1931	M. Farman 26'8	Bristol M. 14 8'8	Hanriot 1 75'2	Farman 48	Hanriot 1 6'6	Hanriot 2 333	Hanriot 2 24	Hanriot 2 65
Hanriot 2 } 80	Blériot Tan. 7'05	Avro 335	Hanriot 1 1921	Blériot Tan. 25'0	Hanriot 1 6'4	Bristol 15 72'9	Blériot Soc. 47	Bristol 14 6'5	Fr. Dep. 333	Fr. Dep. 23	Fr. Dep. 64
Fr. Dep. } 80	M. Farman 7'73	Fr. Dep. 320	Hanriot 2 1898	Bristol 15 25'0	Hanriot 2 6'34	Cody 72'4	Bristol 15 26	Cody 6'2	Cody 288	Blériot Tan. 18	Bristol 14 60'5
Bristol 14 } 75	Fr. Dep. 9'3	Blériot Soc. 310	Bristol 15 1871	Blériot Soc. 24'7	Fr. Dep. 5'9	Bristol 14 70'5	Hanriot 1 26	Hanriot 2 5'9	Br. Dep. 21 267	Cody 19	Hanriot 1 58'4
Bristol 15 } 75	Cody 9'42	Hanriot 1 300	Fr. Dep. 1868	Bristol 14 24'5	Blériot Tan. 5'77	Fr. Dep. 69'1	Blériot 17	Blériot Tan. 5'6	Blériot Tan. 250	Blériot Soc. 17	Blériot Soc. 44
M. Farman } 72	Bristol 14 9'7	Hanriot 2 300	Bristol 14 1839	Hanriot 1 24'0	Cody 5'55	Blériot Tan. 61'1	Fr. Dep. 13	Fr. Dep. 5'4	Blériot Soc. 235	M. Farman 15	Blériot Tan. 43'5
Avro } 65	Hanriot 1 10'4	Blériot Tan. 260	Avro 1762	Cody 23'8	Avro 5'3	Avro 59'9	Hanriot 2 13	Blériot Soc. 5'3	Br. Dep. 20 210	Bristol 14 15	M. Farman 41'7
Blériot Tan. } 60	Hanriot 2 10'75	Bristol 14 210	Blériot Tan. 1499	Hanriot 2 23'7	Blériot Soc. 4'8	Blériot Soc. 58'9	Bristol 14 3	M. Farman 207	Bristol 14 200		
Blériot Soc. }		Bristol 15 210	Blériot Soc. 1481	Fr. Dep. 23'4	M. Farman 2'9	M. Farman 55'2	* Ignition on and off.				

$$X = W_1 \times W_2$$

Bristol M. 15 222
Bristol M. 14 214
Hanriot 1 153
Hanriot 2 151
Blériot Tan. 4 147
Avro Bi. 4 144
Fr. Dep. 138
Cody Bi. 131
Blériot Soc. 118
M. Farman 78

X is the product of weight per h.p. and weight per sq. ft.; it forms an empirical rating factor, and is a function of the speed that is proper to the design of the machine. By analogy, it is like multiplying the weight per h.p. by the gear ratio, in a motor car.

X virtually has the dimensions of V. Thus:—Weight per h.p. has the dimensions $m/lt^{-1} = 1/lt^{-1} = fV^{-1}$; and lift per sq. ft. is known to be a function of V^2 . $\therefore kX = V$. If (see "Principles of Flight," p. 68) the power expended on supporting the loading of the planes is represented by the energy in the air stratum deflected by the wings in flight, then the function of V^2 required to satisfy the above expression for lift is $5mv^2$. Similarly with the weight per h.p.—the work done being directly proportionate to the mass— fV^{-1} becomes $1/mv$.

Thus $5mv^2/mv = 5v$. $\therefore k = 5$. Whence $V = X \div 2 = x$.

From x, which is numerically the speed at which the machine should fly for its given value of X, an expression for the power (h.p.) required can be obtained by direct calculation from the formula $xW/2250$, on the assumption of a gliding angle of 1 in 6. The ratio of this h.p. to the HP. actually available gives the anticipated efficiency ϵ ; and, according to the performances of modern machines, so can the probability of achieving the desired result be gauged. From Table ϵ , elsewhere, the present limit for monoplanes is in the order of 80 per cent., when the energy expended is reckoned as the gliding resistance multiplied by the maximum flight speed.

FLIGHT

MACHINE AS A WHOLE.

E_1 Overall.	ϵ_1 Overall.	E_2 With climb added.
Speed : power efficiency $E_1 = \frac{TV}{HP}$ %	Speed : fuel efficiency $\epsilon_1 = \frac{TV}{F}$ %	$E_2 = E_1 + H\%$
Hanriot 2 ... 81	Avro ... 123	Hanriot 2 ... 105
Bristol 14 ... 79	Cody ... 110	Fr. Dep. ... 103
Fr. Dep. ... 79	Fr. Dep. ... 86	Hanriot 1 ... 99
Hanriot 1 ... 73	Bristol 14 ... 78	Bristol ... 96
Blériot Soc. ... 72	Blériot Soc. ... 77	Blériot Soc. ... 90
Blériot Tan. ... 69	Blériot Tan. ... 70	Blériot Tan. ... 89
Avro ... 69	Hanriot 2 ... 70	Cody ... 77
Cody ... 58	Hanriot 1 ... 68	Avro ... 75
M. Farman ... 58	M. Farman ... 68	M. Farman ... 75

N.B.—For the purposes of approximation, 350 lbs. \times 100 ft./min. ascent is regarded as = 1 h.p. \therefore $\epsilon_1 H$ = h.p. credited to machine for climbing.

For the purposes of approximation, 350 lbs. is regarded as = $W + G$ for all machines; and also that 350 lbs. at 1 m.p.h. = 1 h.p. \therefore V = h.p. credited to machine for transporting useful load in horizontal flight.

Maurice Farman.—This machine belongs so very much to a class of its own, because of its low value of $X=78$, that it is almost impossible to compare it with any of the other machines. The low value of X results solely from its exceedingly low loading on the wings, and not from a low load per horse-power, which has the second highest value of the machines that have flown, the Avro being the highest. In a word, therefore, the Maurice Farman biplane, if it were a motor car, would be described as under-gear. The effect of this on a flying machine is to give it an extraordinary capacity for flying safely at slow speeds, and it seems to be manoeuvrable under any conditions. At its natural gliding speed, which is 38 m.p.h., it has a good gliding angle, and heads the list in this respect, but the effort required to force up the speed to the maximum of 55.2 is not attended with economical results for the machine as a whole when regarded from an overall power efficiency. There is a considerable improvement in the figure, however, when the useful weight carried and the rate of climbing and the fuel are reckoned as the basis in addition to the maximum speed. As there seems to me to be no particular reason why there should be any feature in the detail design of the Farman which should particularly be to its disadvantage, the results mentioned must be attributed to excessively low loading resulting from the very large sail area. In so far as the abilities that attend this peculiarity in design are virtues on their account, therefore, the machine must be removed from comparison with others where the loading is about twice as much and considered on the basis of slow speed safely by itself. $\epsilon=46$ per cent.

Considerable interest attaches to the smaller table containing the figures under the columns X and ϵ . The argument on which these values are based will be found beneath the big table on p. 796. The point is that I regard X as a function of the flight speed that must be attained in order to satisfy the conditions established by the design, the constant of the function being 0.5. Thus, x , which is $X+2$, becomes the anticipated flight speed, whence may be deduced, by multiplying by the weight, the horse-power (h.p.) required. By equating this to the available engine power (HP.), the data in column ϵ is obtained, showing the efficiency anticipated, which it is interesting to compare with the efficiency E_1 actually obtained.

The Hanriots, the French Deperdussin and the Blériot sociable approximate to the anticipated values proper to the design, i.e., x and v (flight speed) are almost identical. Extreme cases that are at variance with this equality, are the Maurice Farman and the Cody, the former of which has surplus power sufficient to increase the speed proper to the design by 40 per cent. It is interesting to note in this case that the actual gliding speed of the machine is almost identical with x . Cody's similarly shows reserve power for 10 per cent. gain on the speed proper to the design. On the other hand, by this reckoning, the Bristol monoplanes ought to fly at about 100 m.p.h. in order to perform under conditions corresponding to those governing the Hanriots and the French Deperdussin and the Blériot sociable. In a word, they have been designed for too high an efficiency, as is shown in the column ϵ .

Although the Farman and the Cody succeed in converting their reserve power into speed, the actual efficiency of the machines does not increase in the same ratio; thus, the Farman, which designs for 46 per cent. efficiency, obtains 58 per cent., whereas Hanriot 2 obtains 81, having designed for 79. Bristol monoplane 14, similarly obtains 81 per cent., but by designing for 111 per cent. is handicapped automatically in the matter of reserve power appropriate for the conditions of a 75 m.p.h. flight speed, also its speed is only 72 m.p.h. The Avro, it will be noticed, is designed for 87 per cent. efficiency, which is just about 7 per cent. more than the best available these days. Thus, as suggested elsewhere, it is slightly more horse-power that is required on this machine.

USEFUL WEIGHT CARRIED ONLY = 350 LBS. ON EACH MACHINE.

V HP.	V F.	$V + .01H$ HP.	$V + .01H$ F.
Speed : power efficiency %	Speed : fuel efficiency %	Speed + climb : power.	Speed + climb : fuel.
Blériot Tan. ... 102	Avro ... 166	Blériot Tan. ... 106	Blériot Soc. ... 113
Blériot Soc. ... 100	Blériot Tan. ... 108	Blériot Soc. ... 102	Blériot Tan. ... 109
Hanriot 1 ... 94	Blériot Soc. ... 106	Hanriot 1 ... 98	Cody ... 100
Hanriot 2 ... 94	Cody ... 96	Hanriot 2 ... 98	Fr. Dep. ... 97
Bristol ... 92	Fr. Dep. ... 93	Bristol 14 ... 97	Hanriot 1 ... 94
Avro ... 92	Bristol 14 ... 91	Fr. Dep. ... 90	Bristol 14 ... 93
Fr. Dep. ... 86	Hanriot 1 ... 90	M. Farman ... 79	M. Farman ... 92
M. Farman ... 76	M. Farman ... 89	Cody ... 63	Hanriot 2 ... 92
Cody ... 60	Hanriot 2 ... 88		

TABLE ϵ .

	x	V	$\frac{V}{x}$ %	h.p.	HP.	ϵ	E_1
Hanriot 1 ...	76.5	75.2	98.5	65.5	80	82	73
Hanriot 2 ...	75.5	75.4	100.0	63.6	80	79.5	81
Blériot Tan. ...	73.5	61.1	83.0	49.0	60	81.7	72.5
Blériot Soc. ...	59.0	58.9	100.0	38.8	60	64.6	73.5
Avro ...	72.0	59.9	82.0	56.5	65	87.0	—
Bristol Mon. 14 ...	102.0	70.5	69.0	83.4	75	111.0	81
Bristol Mon. 15 ...	111.0	72.5	65.2	92.5	75	123.0	—
M. Farman ...	39.0	55.2	140.0	33.5	72	46.5	58
Fr. Dep. ...	69.0	69.1	100.0	57.5	80	72.0	79.2
Cody ...	65.5	72.4	110.0	78.0	120	65.0	69.2

$x = X + 2$ = speed required to satisfy conditions of design.

h.p. = power required to satisfy conditions of design.

ϵ = efficiency required to satisfy conditions of design.

V = speed actually obtained.

HP. = power actually available.

E_1 = efficiency actually demonstrated.

It now remains to mention the machines that have not yet been tested, which is somewhat complicated by the fact that the exact weights in flying order are unknown. In most cases the machines have been weighed empty, however, and by adding about 700 lbs. to each I have inserted the probable weight in flight to the nearest round number.

Machines not yet Tested.

	HP.	A.	w lbs.	W.	W_1	W_2	X
Coventry 10 ...	80	350	1,436	2,100	26.2	6.0	157
Coventry 11 ...	110	300	1,519	2,200	20.0	7.35	147
Bristol Bi. 12 ...	80	387	1,571	2,300	28.8	5.7	164
Flanders ...	100	400	1,571	2,300	23.0	5.75	132
Martin-Handasyde ...	110	310	1,671	2,400	21.8	7.75	125
Handley Page ...	60	240	—	1,500	25.0	6.25	156

HP. = actual horse-power.

A = area sq. ft.

w = weight empty.

W = weight in flight.

W_1 = weight per h.p.

W_2 = loading.

Bristol Biplanes.—The first thing that catches the eye in the table is the extremely high value for $X = 164$ against the Bristol biplane No. 12. Here, the weight per horse-power is proportionately higher than the load on the wings, so that it is the weight of the machine that needs to be reduced in order to bring the working value of X more nearly within the range of modern machines. Unfortunately, the number of biplanes flying successfully in the present trials is so limited that the data for this class will be scarce, but, having regard to the monoplane values, where $X = 150$ already begins to be high, it is reasonable to say that biplanes ought to be designed below this value if they are to be successful under the trial conditions. It is designed for an efficiency $\epsilon = 105$ per cent.

Coventry Ordnance.—Both these biplanes have a very high value of X , but in this case, as distinct from the Bristol, the tendency, at any rate on the machine No. 11, has been to overload the wings. If the Chenu engine gives 110-h.p., the weight per h.p. of No. 11 is quite moderate, so that the evidence points towards the desirability of increased sail area, apart from lightening the machine as a whole. The Gnome-engined biplane is carrying a heavier load per h.p., but one that is quite reasonable in biplanes as a class. No. 10 is designed for efficiency $\epsilon = 88$ per cent.; No. 11 $\epsilon = 65$ per cent.

Flanders.—The engine for which this machine has so patiently been kept waiting, having stripped a timing-wheel during its trial run, left no option but to withdraw from the competition; but if the

motor had delivered 100-h.p. the machine ought to have made some very interesting flights, notwithstanding the fact that the actual weight turned out to be appreciably heavier than was expected. The value of X is about 130, the same as the Cody, which has done so well. $\epsilon = 67.5$ per cent.

Martin-Handasyde.—Trouble with the Chenu engine has been the sole cause of delay, but, apart from failing mechanically, the motor was also much over the anticipated weight, which involved shifting the wings and altering the balance of the machine to its disadvantage. The loading on the wings has also gone up to a high value, but with $X = 125$, the machine ought to go through its tests in good style so long as the engine develops its horse-power. $\epsilon = 61$ per cent.

Handley Page.—The Handley Page monoplane was late in construction and further delay has been caused by a damaged wing. It has not been weighed, but on the maker's estimate the value of X is 156, or a little higher than Hanriot No 1, but its value of ϵ is 97 per cent., or higher than is reasonable to be expected.



MRS. LINDSAY CAMPBELL FUND.

IN continuation of the list published in our issue of August 24th, the following subscriptions are thankfully acknowledged:—

	£	s.	d.		£	s.	d.	
S. R. Livingston Lear-				Thomas Patterson	...	0	5	0
mouth	...	2	2	Hon. W. L. Baillieu	...	10	0	0
R. W. Hudson	...	5	0	Madame Mazet	...	1	0	0
Lt.-Col. Y. Campbell	...	0	10	"W. T. and W. J. J."				
Mrs. F. Y. Ackland	...	1	0	(two working men				
Gen. Lord Playfair,				sympathisers)	...	0	2	0
--C.V.O.	...	1	0	M. Lamafeld	...	0	2	6
H. A. Coutts	...	0	5	Owen Fleming...	...	1	1	0
G. F. Todman	...	3	3	Miss Ida Cunningham	...	1	1	0
"S."	...	5	0	J. V. Fann	1	0
"M. H. R."	...	1	0	A. F. Turner	...	0	5	0

Further subscriptions are earnestly solicited, and may be sent to Col. H. S. Massy, Coventry House, Coventry Street, W.



Mrs. Lindsay Campbell, the widow of the late Mr. Lindsay Campbell, on whose behalf and her two little bairns, seen in our photograph, further appeal is made for help in the great loss she has sustained. Mrs. Campbell is left penniless by her husband's recent death during his patriotic work on behalf of Australian aviation, which he hoped to help organise as an asset in the British Empire flying forces.

Vickers, Breguet and Piggott.—The information available is insufficient to permit of the inclusion of these machines in the above discussion.

Radius of Action.

Distance in miles which can be flown on one charge of fuel and oil; also the miles flown per gallon by each machine.

	Distance in Tank.		Miles per Gallon.	
	Petrol.	Oil.	Petrol.	Oil.
Hanriot 1	408	400	9.6	33
Hanriot 2	361	406	8.8	36
Avro	345	840	15.0	120
Bristol 14	343	331	8.8	4.1
Cody	336	742	8.0	172
Fr. Dep.	315	388	8.2	52
Blériot 4	305	298	11.3	36
Farman	276	364	7.9	76
Blériot 5	252	327	9.35	35



THE DAILY MAIL DEMONSTRATIONS.

DURING the past week the popular demonstrations organised by the *Daily Mail* have been continued at various towns.

On Wednesday Mr. Travers in a waterplane flight from Margate to Herne Bay and back carried Mr. Bonar Law, Junior, as passenger, the wind driving at about 45 m.p.h. at the time. Rising to a thousand feet he flew over Herne Bay Pier and then returned safely to Margate. M. Salmel made a start from Shoreham to Southsea, but the violent weather was too much for him and in half an hour he landed at East Preston, near Littlehampton, it taking him 40 minutes to cover the ten miles. Mr. Hucks at Leeds gave some exhibition flights at Lofthouse Park. In a 20 minutes' flight he travelled round Leeds at 2,000 feet and subsequently steered for Wakefield when he was at about 4,500 feet, a flight altogether of about 20 miles.

On Thursday, Salmel continued his journey to Southsea, which he reached safely, landing near Gosport. After flying over Southsea he went on to Southampton, and gave some excellent exhibition flights to the thousands awaiting his arrival. Mr. Hamel went from Southport to Northwich, crossing over the River Mersey past New Brighton, Liverpool, and Warrington, about 40 miles in 40 mins.

Friday, Mr. Noel was at Margate out early, carrying Councillor Adutt as passenger, but the weather prevented him from getting away to Southend as had been announced. M. Salmel was weather-bound at Southampton, and Mr. Hucks arrived at Strathpeffer, Ross-shire, in anticipation of giving exhibitions in Scotland, and subsequently Ireland, in a similar manner to those which have been so much appreciated throughout England. On the Saturday Mr. Hucks gave the natives a first instalment of his fine powers of flying, this being the more appreciated by the fact that a Highland gathering was in progress. In the afternoon he rose rapidly to a great height above Ben Wyvis, a 3,000-foot hillock, continuing his trip on to Dingwall, there circling a well-known landmark, the tower erected to the late Gen. Sir Hector Macdonald, returning subsequently to his starting point. Some excellent exhibition flights followed, and after circling Knockfaril he had a bit of a sprint with a Highland railway train, beating the latter badly. Salmel was able to reach Leamington, about 100 miles away from Southampton, during the afternoon, the journey occupying one and a half hours, in spite of rain and mist necessitating his flying at the low altitude of about 300 ft. Mr. Noel on his waterplane flew from Margate to Sheerness and on to Southend.

On Monday, Salmel left Leamington for Burton in the afternoon, but had to give up at Bradwell, a distance of about ten miles, through the fearful weather. No other flights were attempted during this awful day, which is memorable by reason of the six inches of rain which fell at Norwich.

Mr. Grahame-White resumed displays on Tuesday, he, with Mr. Travers and Mr. Noel, flying at Southend. Mr. Grahame-White made a trip as far as the Isle of Grain, with his wife as passenger, receiving great greetings upon his return. Mr. Hamel flew from Northwich to Macclesfield in 17 mins., and then on to Buxton, passing over the Cat and Fiddle mountain at a height of 2,500 ft. At New Brighton, M. Fischer, on his waterplane, flew up the Mersey, and circled high for 15 mins., then carrying passengers. M. Hubert was also in the air. M. Salmel during the day reached Burton.

Mr. H. J. D. Astley Flies the Channel.

ON Wednesday morning, starting from Hendon, on a Blériot, at 7.45, with Miss Trehawke Davies as passenger, Mr. H. J. D. Astley, in a try to lower the London-Paris record, flew the Channel, landing at Hardelot-Plage at 9.30. Re-starting at 12.45, Issy was reached at 4.45 p.m.

HYDRO-AEROPLANES—ST. MALO-JERSEY MEETING.

UNDER the auspices of the Automobile Club de France and the patronage of the Minister of Marine, the much talked of hydro-aeroplane meeting took place in the Bay of St. Malo during the extended week-end August 24th, 25th and 26th.

Twelve machines were entered, one each Astra biplane, Borel monoplane, Deperdussin, Donnet-Leveque, Maurice Farman and Nieuport, two Paulhans, one R.E.P., two Sanchez-Besa and one Train-Astra. With the exception of the three latter, all machines were fitted with three floats, the Sanchez-Besa having two floats, while the Train-Astra has only one. Gnome or Renault engines are fitted to all machines except the Paulhan, which has a Curtiss. With the exception of about one, all the machines used Chauviere "Integral" propellers.

The pilots for the machines in the order mentioned were Labouret, Chambenois, Busson, Beaumont, Renaux, Weymann, Barra, Mesguich, Molla, Benoist and Rugere.

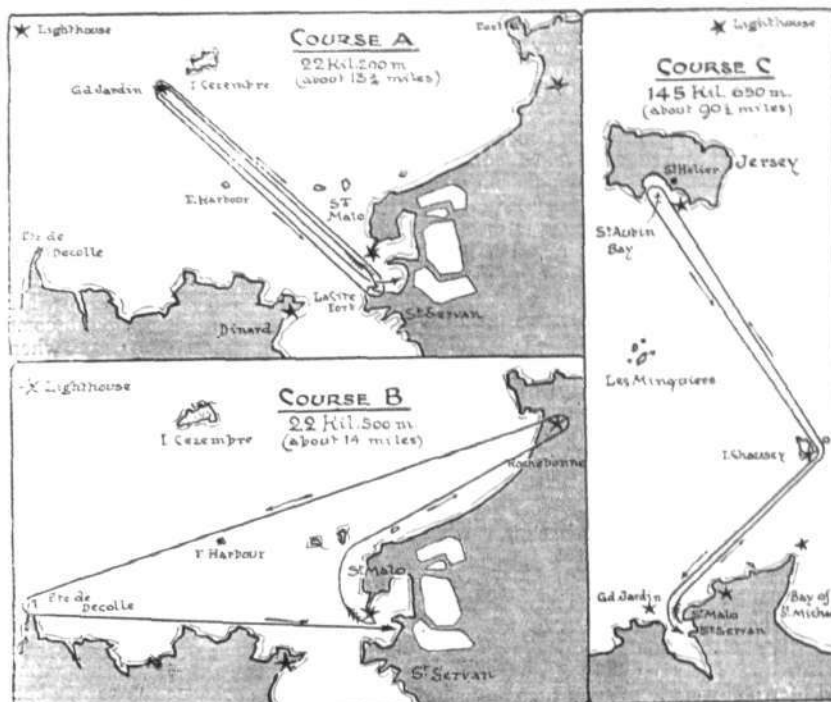
The sketch maps which we publish show the three courses of the competition, and a system of marking was drawn up, as already published, having for its basis a sliding scale by which so many points were given to the first, second, and third in each event, according to the number of passengers carried by the machine, and to the course over which the event was held.

The start was timed for 2 o'clock on Saturday, but, owing to the weather, was postponed till half-past three, when the two Paulhan-Curtiss machines put off from the Lac aux Canards for the Grande Jardin lighthouse. The complete course is 15 miles in length, but Barra was upset before he had gone one, Rugere and Weymann likewise got tumbled into the water, while Mesguich had to hydroplane home. Against these misfortunes stand the successful flights of Labouret (Astra), two passengers, net time 11 mins. 10 secs.; Busson (Dep.), one passenger, net time 13 mins. 3 secs.; Molla (R.E.P.), 13 mins. 27 secs.; Renaux (Farman), two passengers, net time 15 mins. 11 secs.; and Benoist (Sanchez-Besa), one passenger, net time 15 mins. 46 secs., who were returned for the event in the above order.

On Sunday, when Course B was flown, several exciting incidents again occurred, Weymann landing in the bay on his Nieuport as the result of engine trouble, as also did the Paulhan-Curtiss and one of the Sanchez-Besa. The Dep. likewise made a faulty landing in the sea and dived under the water, from which predicament, however, the pilot and passengers were safely rescued. Mesguich had the misfortune to be thrown out of his machine on a forced landing in an awkward place, and broke his leg. The result of the race over Course B was a first place for Benoist on the Sanchez-Besa, with three passengers, who flew round in 20 mins. 33 secs.—net time 9 mins. 14½ secs. Labouret (Astra), two passengers, net time 10 mins. 45½ secs.; Molla (R.E.P.), one passenger, net time 12 mins. 29½ secs., and Renaux (Farman) secured the second, third and fourth places. Mesguich did not finish the course, and Weymann did not fly round Rochebonne Lighthouse. In the combined events, however, Labouret was leading on Sunday night.

On Monday, the third and last day of the meeting, the machines had to make a 50-mile flight to the island of Jersey, and in spite of the cold unpleasant weather Benoist on the Sanchez-Besa started out soon after 8 o'clock, and was quickly followed by the R.E.P., Astra,

Nieuport, and Farman. Renaux on the Farman returned after reaching Chaussy, but the others continued, and were duly announced by wireless as having safely arrived. After an interval of about an hour the return flight started, the Astra biplane being the first



THE ST. MALO-JERSEY HYDRO-AEROPLANE CONTEST.—Sketch maps showing the three courses covered by the competitors at the Three Days' Race Meeting.

machine sighted by the cruiser "Gloire," which was on patrol. Weymann on the fast Nieuport monoplane came after him at a great pace, however, and both entered the harbour together, the former crossing the line first. Molla on the R.E.P. and Benoist on the Sanchez-Besa were not far behind.

Their times were: Weymann (1 pass.), 1h. 41m. 24s.; Labouret, 2h. 11m. 46s.; Benoist (2 pass.), 2h. 49m. 14s.; and Molla, 2h. 53m. 30s.

The final classing for the three courses, with points lost, prize money, &c., is as follows:—

Machine and Motor.	Pilot.	Points.	Races Completed.	Amount Won.
1. Astra (Renault) ...	Labouret	9	3	15,000 frs.*
2. Sanchez-Besa (Renault) ...	Benoist ...	14	3	10,000 "
3. R.E.P. (Gnome) ...	Molla ...	16	3	6,000 "
4. Farman (Renault) ...	Renaux ...	21	1	4,000 "
5. Nieuport (Gnome) ...	Weymann	25	1	2,000 "†
6. Paulhan (Curtiss) ...	Mesguich	36	None	666 "

* Also takes Minister of Marine Prize.

† Also the Jersey Speed Prize.

The first five used Chauviere Integral propellers.

"Hansa" Skims the Surface of the Elbe.

ON Saturday last the Zeppelin dirigible "Hansa" made a trip from Hamburg sailing for some distance along the bank of the Elbe, then descending to the water and maintaining her course with the two cars resting on the surface. The dirigible steered her way with ease down the stream for fully ten minutes or more, her port and starboard propellers being utilised alternately to maintain straight steerage way. She was able to sail at a speed of about three or four nautical miles an hour, several small steamers being overhauled during her progress.

Aeroplane Handicap at Brooklands.

THE flying event in connection with the motor race meeting at Brooklands on September 28th will consist of a cross-country handicap for all classes of aeroplanes. The distance out and home will be about 10 miles and the prizes are as follows:—The entrant of the winner to receive 50 sov. or cup at option; the entrant of the

second to receive 25 sov. or cup at option; and the entrant of the third to receive 10 sov. or cup at option. Entries close September 21st, at 12 noon. Entrance fee: 1 sov., p.p.

The "Cellon" Dope and Windows.

THE Cellon Co. wish us to point out that Cellon is a non-inflammable dope, and that it was an unfortunate error that Mr. Mervyn O'Gorman was handed, in the Flanders shed at the Military Trials, a piece of celluloid which had been mistaken for Cellon. Cellon is used on the fuselage of this machine as windows, and Mr. O'Gorman had been remarking on this dope when the incident, which might have led to some confusion, occurred.

It may be remarked that the Avro biplane, which flew for some time recently in a rain storm, was also covered with Cellon, and the pilot was absolutely unaware that it was raining, merely thinking he was passing through a thick mist, being quite protected by the windows made from this excellent dope.

FROM THE BRITISH FLYING GROUNDS.

Royal Aero Club Eastchurch Flying Ground.

AGAIN we have been favoured with unprecedented August weather, there having been only three occasions when flying was possible, Thursday evening being one, when Lieut. Malone took out the 100-h.p. tractor biplane, Commander Samson 50-h.p. Short tractor, Lieut. Gregory School biplane 34, these officers making best use of the temporary calm. Friday was completely out of the question. Saturday favoured us with a dead calm from 5 o'clock p.m. until sunset, when Commander Samson, 50-h.p. Short monoplane, Lieut. Malone, 100-h.p. triple tractor, with Capt. Gordon as passenger, and Lieut. Gregory, School biplane, all put in some circles of the island. Later in the evening Mr. Fowler went as passenger with Lieut. Malone on the 100-h.p. triple tractor biplane and put in a 45 minutes' flight. Mr. Jezzi was out on Jezzi biplane but the engine was not running up to scratch and was consequently returned to shed for adjustments. Lieut. Gregory tested Austrian Daimler engine of the Etrich monoplane and afterwards flew School biplane and practised landing by the aid of glare-light, it being then dark.

On Sunday evening Mr. Jezzi took advantage of the calm and was out giving passenger trips to Mr. Travers and later to Master Raymond Fowler, who thoroughly enjoyed his trip.

On Saturday, M. Noel landed at Sheerness *en route* for Southend, having lost his bearings; he completed the journey on Sunday morning.

Brooklands Aerodrome.

TUESDAY evening last week saw an abatement in weather, and the Bristols came out in force. Mr. Merriam was on one biplane and Mr. Hotchkiss on another. Then both pilots started giving tuition flights to the officers Fazil, Abdullah, Aziz, Fethi, Mehmed Ali, and Sahni, Capt. Price and Styles MacDonnell, Lieuts. Glanville, Carmichael, Hope, and Hanlon, and Messrs. Hall, Payze, and Pretymann and Lieut. Loutcliffe. Messrs. Hotchkiss and Merriam were kept more than busy as they managed to take up all these pupils a couple of times each, giving most of them a couple of circuits, with a right-hand turn thrown in.

In the meantime, on the two solo machines, Major Ashmore, Lieut. Joubert, Mr. Gould, and Mr. Barnwell were each flying figures of 8. Messrs. Cheesman, Summerfield, Darracq, and Lieuts. Wanklyn and Playfair, all flying good circuits, while Capt. Boger and MacDonnell were taxiing.

Prince Cantacuzene and Mr. Bettington were flying straights on the Anzani monoplane.

The Vickers machines were out, No. 3 in the hands of Capt. Stott and Mr. Geere, while No. 5 was flying circuits at a height of about 800 ft., in the hands of Mr. Knight.

Wednesday evening, about 7 o'clock, the wind dropped a little, and Mr. Hotchkiss went out to try conditions, and finding fairly favourable sent Mr. Barnwell for the first part of his *brevet*, which he took in a masterly fashion. Mr. Pickles afterwards making a flight when nearly dark to get machine back to hangar.

Thursday evening weather not at all good, but Mr. Hotchkiss and Mr. Merriam made several tuition flights with the Bristols, which were confined mostly to straight lines, the Bristols being the only hangars to pull down their doors.

Friday morning, as soon as daylight started to appear, Mr. Hotchkiss was out making some dozen flights with pupils in very bumpy weather. Messrs. Barnwell, Cheesman, Major Ashmore, Capt. Miller, and Lieut. Joubert all flying straights solus, weather being too bad to risk more. Mr. Perry and Hedley also out on Farman biplane giving tuition.

Saturday evening a big lot of flying was got through. Mr. Merriam came out about 4 p.m. on a Bristol biplane to try conditions, then sent Mr. Barnwell to get the second half of his *brevet*. From then till dark seven or eight machines were flying continually. The six Bristol School machines carried as passengers and solus flyers as many as 28 pupils, nearly all of them being fortunate enough to get two flights each. Amongst this flying three pupils took their *brevets*, the three new pilots being the Hon. C. Brabazon, Lieut. Joubert de la Ferté, and Mr. Barnwell, all three giving an exhibition of flying, characteristic of the class of pilots the Bristol School turns out.

The monoplane section of the Bristol School were equally busy. Mr. Merriam was testing one Anzani monoplane, Mr. Hotchkiss another. Prince Cantacuzene, Mr. Bettington and Mr. England afterwards all flying well. Sopwith's Farman was flying most of the time with Capt. Ellington, Mr. Hawker and other passengers; both Mr. Perry and Mr. Hedley putting up very good flying. Mr. Percival was flying straights on his tractor biplane, which has not been seen outside the hangar for some time.

Vickers No. 3 was flying straights in the hands of Capt. Stott and Mr. Geere. Mr. Hotchkiss was seen doing a spiral *vol plané* from

about 500 ft., and when nearing the ground Mr. Geere on the Vickers started off in a straight line, cutting it a bit fine for the Bristol. Capt. Stott when landing was unfortunate enough to carry away half his landing carriage, which greatly amused the crowd to see the machine settle down on one wing. Mr. Knight was out on Vickers No. 5 flying very well at over 1,000 feet and making an excellent *vol plané* in front of the enclosure from that height. Lieut. Hewlett was on the Vickers-Farman biplane carrying a lady passenger for several circuits. The new Roe machine was tied up outside its hangar testing the latest A.B.C. engine which seemed to be running in a neat business-like way, and possibly will be heard of doing good work in the near future.

On Sunday morning all the Bristols were again out. Lieut. Joubert de la Ferté finishing the second test for his *brevet* and thus adding another name to the list of pilots. Some 20 pupils of the school all benefited by flights either solus or carried by Mr. Hotchkiss and Mr. Merriam. An amusing incident was caused at the expense and discomfort of Mr. Merriam who was flying an Anzani monoplane, when his engine stopped over the sewerage farm which forced a landing in the middle. The machine turned turtle throwing Mr. Merriam into a big pool but fortunately doing him no injury. The machine was pulled out, and only damage found was a broken propeller.

Sunday night all schools were as busy as ever. Major Ashmore flew a splendid *brevet* test on a Bristol, making the fourth pilot from that school in two days. Lieut. Gould then went away for the first half of his *brevet* on a Bristol biplane, and flew five figures of 8 at an average height of about 500 ft., but unfortunately misjudged his long *vol plané*, and landed perfectly, but about 100 yards from mark, so he has to fly again. The Bristol School got most of their pupils together and had a photo taken in front of the hangars, and there appeared in front of the camera some 35 pupils. This looks very terrible, but as the school have running some nine machines, all entirely kept for pupils, the average of pupils to machines is pretty good.

Eastbourne Aerodrome.

On Wednesday, Thursday and Friday last week, wind and rain prevailed, but on Saturday weather improved considerably and by 5 p.m. it was quite calm. Mr. Foggin took out the 28-h.p. Anzani and made a number of short flights. His climbing angle was at times somewhat alarming, but otherwise he managed the machine very well. On Sunday morning work commenced at 5 a.m. when Mr. Hammond took out the Bristol for a trial flight. After making two circuits of the ground he flew along the Front as far as the Pier, passing right over Mr. Travers who was out on his Curtiss hydro-aeroplane. On his return from the Pier Mr. Hammond took up Lieut. Duverly a new pupil for instruction. By 8 a.m. the wind had freshened somewhat and work was postponed until 4 p.m. when Mr. Hammond made a solo flight on the Bristol, again visiting the sea front where he gave a splendid exhibition of flying, much to the delight of the huge crowds that collected on the Parade. Later he took up in turn Lieut. Duverly and Mr. Lerwill. Mr. Foggin was also practising on the 28-h.p. Anzani. He made one successful short flight, but at his second attempt he failed to get his machine to rise and was so vicious with his elevator that he burst a tyre and broke a number of wires.

Monday was too rough for outdoor work. Tuesday turned out fairly fine and by 4.30 the wind had dropped to five miles per hour. Messrs. Foggin and Gassler were out on the 28-h.p. Anzani. The latter made two very good flights. Mr. Hammond gave an exhibition flight on the Bristol and afterwards took up Lieut. Duverly for further instruction.

Farnborough (R.F.C.)

Tuesday evening last week, Major Burke and Lieut. Longcroft both long flights on BE 1; Mr. de Havilland several flights on BE 5, taking passengers. Next day early Lieut. Longcroft one hour's flight on BE 1, height 5,000 ft., later one of 30 mins. and one of 15 mins. on the same machine. Capt. Rayleigh arrived from Salisbury on Breguet B 3, making good time, flying at good height. Captain Darbyshire and Capt. Webb Bowen doing straights on BE 5. All out again in the evening putting in a lot of work until dark, including Capt. Rayleigh on 100-h.p. Breguet and Lieut. Carfrae on Breguet B 3. Capt. Reynolds, on Maurice Farman, when starting for a flight broke propeller.

Major Burke, Thursday, on BE 1, several flights, later Lieut. Longcroft, on same machine, 40 mins. flight round Alton district with Lieut. James as passenger, then one of 35 mins. round Godlingham district with Lieut. Herbert as passenger. Capt. Darbyshire and Capt. Webb Bowen each flights on BE 5, Capt. Rayleigh on 100-h.p. Breguet, Lieut. Carfrae on Breguet B 3 several flights, one at 4,000; Capt. Rayleigh, on rolling up to shed, caught wings of

BE 5 and broke ribs, also propeller. About 9.30 p.m. airship Gamma did 1-hour flight in gusty wind and rain, making good landing in the dark.

No flying Friday owing to bad weather, all work confined to hangars.

Saturday evening, Major Moss returned from Basingstoke on Henry Farman, taking 20 mins. for the journey; he had been held up there twelve days owing to engine trouble and bad weather. Lieut. Barrington-Kennett several flights on BE 3, which is fitted with wireless. Capt. Rayleigh on 100-h.p. Breguet, Lieut. Carfrae on Breguet B 3, and Major Burke and Lieut. Longcroft each flights on BE 1, Capt. Reynolds up 15 mins. on Henry Farman, all flying till dark.

Early Tuesday Lieut. Longcroft on BE 1, Lieut. Mackworth on BE 5, taking passenger, Capt. Rayleigh on 100-h.p. Breguet, Lieut. Carfrae on Breguet B 3, Major Moss on Henry Farman, Capt. Darbyshire and Capt. Webb Bowen flights on BE 5, all doing well. Airship Gamma several flights about 11.30 a.m. Gamma came out again later for half-hour's flight. Flanders monoplane out on War Office tests.

Freshfield, Lancs.

THE only flying at Freshfield last week was Saturday morning, when Mr. Higginbotham took his machine out soon after 5 a.m., when the conditions were ideal. After an hour's work he had to give up owing to the insulation in the magneto breaking down, and he having no spare machine to put on.

London Aerodrome, Collindale Avenue, Hendon.

Grahame-White School.—Weather too bad all the week to favour a good attendance of pupils, but Mr. Blackburn out on Wednesday morning at 5.30, on the Howard Wright, giving "joy rides" to pupils. Mr. Lewis Turner out in the evening at 7 o'clock, but still too much wind for pupils alone, so after taking up Mr. Fuller, Lieut. Allen and Lieut. Small (a new pupil) work finished for the day.

On Thursday morning school work started at 6.45 under instruction of Mr. Lewis Turner. Lieut. Allen got in a good half-an-hour's practice, after which weather too bad for further work.

Sunday morning, at 5.30, Lieut. Allen did some good straight flights. Mr. Turner instructing Mr. Marrick, after which the latter did some good straight rolling alone. Lieut. Allen finished morning's work by doing more good straights, making excellent landings.

After a wet morning on Saturday, which flooded everything and resulted in a small attendance, the weather brightened at 3 o'clock, and at 3.30 Mr. Lewis Turner got away on a Grahame-White biplane and gave an excellent exhibition of flying, lasting about 20 mins.

At 4 o'clock Mr. Desoutter out on No. 6 Blériot giving a fine display in banking and switchbacking. Mr. Turner out again carrying several passengers, including Capt. Tyrer. Meanwhile Mr. Nardini on 50-h.p. Deperdussin, and Mr. R. T. Gates on 80-h.p. Henry Farman with passenger, both doing some fine piloting, the latter reaching an altitude of about 2,000 ft.

At 5.30 Mr. R. Slack out on his I.C.S. touring Blériot, and after attaining a height of about 1,000 ft. set off for Croydon. Mr. Gill out on Deperdussin, and Mr. Turner finished the day's work by giving more passenger flights on the Grahame-White biplane.

Weather more settled on Sunday, so a much better attendance, and plenty of good flying from 3.30, when Mr. Turner, as usual, started things moving, after which there was one continuous din of running engines until dark. At one time six machines were in the air. Mr. R. T. Gates on the Henry Farman flying at a good altitude, Mr. Turner up with a passenger on the Grahame-White biplane, Mr. Desoutter out on a Blériot, Mr. Ewen on a Caudron biplane, and Messrs. Nardini and Gill on Deperdussin monoplanes. The weather excellent for passenger work, and Mr. Turner was kept busy carrying over two dozen passengers during the day.

Blériot School.—Weather practically stopped all work last week. On Saturday, at the conclusion of the weekly meeting, school was commenced, there being a dead calm, and Mr. Hall put in a couple of straights, one on LB 2 and one on LB 3, and M. Gandillon did a roll across and back on LB 1. The ground mist then rapidly spreading put a stop to further work.

British Deperdussin School.—No flying, too windy, Wednesday, last week. Thursday morning, Brock, Cadet Robinson both doing straight flights on *brevet*, making good landings. Lieut. Hawker and Mr. Phelps rolling on taxi No. 1. Gill four circuits on racer. Friday, Lieuts. Tucker and Hawker, Messrs. Spratt and Phelps all rolling on taxi No. 1. Saturday evening, Mr. Brock out on *brevet* machine making excellent circuits and neat landing. Lieut. Hawker and Mr. Phelps out on taxi No. 2, both making good progress. Heavy rain all Monday and Tuesday morning and in evening Mr. Brock, Cadet Robinson doing straight flights on *brevet*. Lieuts. Hawker and Tucker, Messrs. Andrews, Spratt and Phelps and Durand all rolling on taxi No. 2. Gill two circuits on racer.

W. H. Ewen School.—Weather on Monday and Tuesday last week precluded any possibility of the school being out. There was a short spell of calm on Wednesday morning when Lieuts. McMullen and Bayly had some good rolling practice. A fair amount of work was got in on Thursday morning before the rain and wind again came on. Mr. J. H. James made several good flights on the Blériot, landing with certainty every time from 16 and 20 ft. Mr. T. S. Apar did some rolling and a straight flight. Messrs. Ware and Edmund were flying well on the *brevet* machine, while Lieuts. Bayly and McMullen were making good progress in their straights. The school was out on Friday morning but a "discontinuation" took place on account of the wind and rain. The pupils were delightedly surprised to get in an evening's work on Saturday, and Messrs. Conran, James and Lieuts. Bayly and McMullen showed splendid improvement, and Messrs. Sutton and Ware were handling the *brevet* machine with great confidence. Mr. Ewen was testing the latest arrival at the school, a 35-h.p. two-seater Caudron, which was flying splendidly. The pupils got in a great amount of work on Sunday morning, over two hours' practice being put in. Messrs. H. H. James, Conran and Lieuts. McMullen and Bayly were hopping and Mr. J. H. James made several neat flights. Messrs. Sutton, Edmund and Ware were flying well on the *brevet* machine, but unfortunately the latter made a bad landing causing some little damage to the machine. Mr. Ewen brought out the 35-h.p. Caudron two-seater and took the above pupils up in order for air instruction. In the evening Mr. Ewen was again out with the two-seater taking several pupils up for instruction, and Mr. Keith-Davies was also given a flight.

Salisbury Plain.

Royal Flying Corps.—Tuesday last week, miserable day, outdoor work out of question until evening, when a few flights were given. Moineau first out on B 3 Breguet, which was not climbing at all well, testing machine for the R.F.C., Lieut. Fox followed on BE 2 with two good flights in rough weather, being caught in a heavy shower. Lieut. Mackworth on BE 4 made four useful flights in stiff wind, scouting around the camps. Mr. Pizey made good flights on Bristol monoplane, testing for the R.F.C. Capt. Ranleigh took out B 3 Breguet after its test with Moineau, machine going fairly.

Wednesday, Capt. Ranleigh on B 3 Breguet took off at 7.25 a.m. for test flight before leaving for Farnborough, flying for 15 mins., machine behaving well, he landed for short time at 8.3 a.m., and then rose again quickly to height of 700 ft. in a stiff breeze, flying around Lark Hill Camp, then heading off towards Farnborough at a good speed. Lieut. Mackworth made several trips on BE 4, scouting the Plains in good form. Capt. Hamilton on the Deperdussin monoplane put up some splendid work, flying for 20 mins. at a great height, finishing with a fine *vol plané* and perfect landing. In evening several officers were out again. Capt. Hamilton on the Deperdussin, flying around Fargo Camp, had to come down owing to engine trouble. Mr. Pizey testing Bristol monoplane for the R.F.C.; made good flight, answering all its requirements. Lieut. Mackworth on BE 4; several flights with passengers. Lieut. Fox on BE 2; four splendid flights in scouting practice, with passengers, at times flying at heights of 700 to 1,000 ft., and finishing with good landings. Major Carden testing the Dunne biplane, which had been under repair, and now ready again for active work. Mr. Dunne was at the hangars; also Mr. Green was in attendance, his engine working very satisfactorily.

Very fine morning Thursday. Capt. Allen was on the R.F.C. Bristol monoplane putting up a splendid flight, rising to a height of 1,500 ft., flying 20 minutes, finishing with a fine glide and making a perfect landing, followed by Lieut. Fox on BE 2 making several flights, with passengers, dropping one of them at the R.F.C. Camp, then taking off again and rising to a height of 2,000 ft. Lieut. Mackworth on BE 4 and Major Brooke-Popham made two good flights rising to height of 800 ft. very quickly. Lieut. Fox also was out on FE 2, fitted with a Maxim gun, doing scouting practice at a good height, banking and sharp turns right and left, finishing in grand style. In evening Mr. de Havilland made seven flights on BE 2, fitted with Renault engine, taking up four passengers at different times, doing fine banking and very sharp turns. Capt. Hamilton, on his Deperdussin, taking off very quickly to a height of 1,200 ft. After landing, got away again, flying around Knighton Downs. After landing he was taxiing when one spar on the undercarriage broke, which put the machine out of action for the rest of the evening. Lieut. Fox on FE 2 made two fine flights, flying at a height of 700 ft., scouting around the Downs, finishing in fine style. Capt. Allen on monoplane made two flights at good height. Also Lieut. Bettington put up two flights, with fine landings. Lieut. Mackworth's machine caught fire, but no damage was done. Friday, owing to unfavourable weather, no outdoor work was done.

Saturday morning very unsettled. Towards afternoon a welcome change. Mr. de Havilland out on BE 2, made six splendid flights,

one for 30 minutes, one with Mr. Bell as passenger. Lieut. Fox on the Dep. monoplane, with Lieut. Ashton as passenger, also Capt. Thorpe, scouting around the Plains at a good height. Fox also testing engines of two-seater Blériot monoplane. Engine missing, he took BE 2 for a trip, climbing to a great height very quickly, making some fine circles and finishing with a graceful glide. Lieut. Ashton made two flights on the Dep. monoplane, being quite at home and doing remarkably well. Capt. Allen made a fine show on monoplane, but on landing had the misfortune to buckle a wheel, which caused the chassis to give, but nothing very serious, pilot unhurt. Major Carden had the Dunne biplane brought out after testing engine, and put up good flight, finishing with a perfect landing.

BRITISH NOTES OF THE WEEK.

Dublin-Belfast Race.

ALTOGETHER fifteen entries have been received for this important Irish event. They include Henry Jullerot (Bristol), Henry J. D. Astley (Blériot), William H. Ewen (Caudron mono.), E. Obre (Caudron mono.), Robert B. Slack (Blériot), "Marc Rivoli" (Vickers mono.), Desmond Arthur (Bristol mono.), Sydney V. Sippe (Hanriot mono.), H. R. Simms (Avro biplane), D. Corbett Wilson (Blériot mono.), Lieut. Porte (Deperdussin mono.), H. Busted (Bristol), J. R. F. Lecky (Twining biplane), G. Hamel (Blériot), Handley Page (Handley Page mono.). Keen competition is expected with such men as Gustav Hamel, Astley, Lieut. Porte, and Sippe amongst the competitors. The Great Northern Railway Co. (Ireland) are running a special fast express open saloon train to allow spectators to view the contest, and to while away the intervals of waiting, exhibition and passenger flights are to form part of the programme at the Dublin ground. At Belfast a 30-minute stop is provided before the return journey is resumed. Full particulars, by those keenly interested, can be obtained from the secretary of the Aero Club of Ireland, 35, Dawson Street, Dublin.

Air Work at the Army Manœuvres.

IN connection with the Army Manœuvres, always of course subject to their not being cancelled owing to the disastrous weather, the Royal Flying Corps will be in the Red Camp, about one mile to the south of Thetford, Norfolk, with Major H. Sykes, Commandant in charge. Capt. C. J. Burke takes over the control this week of nine aeroplanes and possibly three more later. Either the Gamma or Delta dirigible is also expected in the vicinity of the Thetford Camp. A section of the Royal Flying Corps is also to be established with the Blue Army, their quarters being further south, possibly near Royston or Cambridge.

Flying at Hendon.

AS usual there will be a number of flying attractions at the London Aerodrome to-day, Saturday, when the final August Meeting starts about 3.30 including Cross-Country Handicaps, Speed Handicaps, and Altitude Contest, whilst exhibition and passenger flights will also be a strong feature. As the various events are run in heats, there is always plenty of work going on for visitors to watch. Mrs. Stocks is down to take part and amongst the flying men are Messrs. H. J. D. Astley, Nardini, Desoutter, Richard T. Gates, Lewis Turner and W. H. Ewen. Also on Sunday, as usual, there will be exhibition passenger carrying flights. A comforting point is that when at Hendon, there is excellent accommodation for afternoon teas and cold luncheons for those who care to get there early and stay late for the very fascinating entertainment.

Cross-Country Flight by Lieut. Fox.

ON the 25th inst., Lieut. Fox, R.E., accompanied by Lieut. Burchardt Ashton, of the Royal Irish Dragoon Guards, as passenger, made a cross-country trip on the Army Aircraft Factory biplane, from Lark Hill, Salisbury Plain, to Weymouth, about 50 miles distant. Later the officers continued on from Weymouth to Monmouth, covering the distance of about 83 miles under the mile a minute, having left Weymouth at 3 p.m., and reached Monmouth at 4.20. Their intention was to return to Salisbury Plain on the following morning, but owing to a continuous downpour of tropical rain for about sixteen hours their plans were necessarily delayed.

Vivian Hewitt at Abergele.

THE weather here has been very bad lately, and quite unfit for flying. On Friday last Vivian Hewitt was up for about an hour in the morning, from 12.30 till 1.30. There were a great many people in Rhyl for the week-end, and he would have stayed up much longer but found the wind so bad, owing to the close proximity of the mountains up the Vale of Clwyd. Mr. Hewitt's name had been entered in the minute book of St. Asaph, the smallest city in the world, as being the first one to soar over the Cathedral in an aeroplane. It will be recollected that this was some little time ago.

Sunday morning was good for outdoor work. Major Carden flying around the camps with his Dunne biplane, making good landings. Weather continued fine, when Mr. Dunne brought out his monoplane, which has been reconstructed, chassis being made much lighter and fitted with Gnome engine. Without doing any rolling, he rose straight away to a height of 150 ft., flying for 20 mins., getting in some fine banking and turns.

Monday, no flying owing to bad weather.

Tuesday, early morning, Capt. Hamilton out on his Deperdussin monoplane, scouting around the Plain, flying for one hour at a great height. Lieut. Fox testing two-seater Blériot monoplane.

Mr. R. B. Slack Starts a Fresh Tour.

ON Saturday last Mr. R. B. Slack got away from Hendon at 5.40 p.m. on his Blériot monoplane for a fresh tour, this time of the Southern Counties, on behalf of the International Correspondence School. His destination was to Purley, which he reached in 26 minutes, steering by compass. He landed on the Woodcote Golf Links on Smitham Downs. On Sunday, Slack put up a flight around Purley, and from a collection made on the ground, the Croydon General Hospital benefited considerably. The further route to be taken by Mr. Slack is to Shoreham, Brighton, Aldershot, and Oxford, Chatham, &c.

Sabelli Flies to Salisbury Plain.

ON Thursday, last week, Sabelli on a 50-h.p. Hanriot, made an excellent flight from Brooklands to Salisbury Plain where the Army Trials are in operation. In spite of a strong wind averaging about 25 m.p.h., Sabelli steered a straight course for his destination.

Corbett Wilson after a Cross-Channel Flight.

STARTING from Issy on Sunday morning at 6 a.m., Mr. Corbett Wilson, of Irish Channel-crossing fame, on the Gnome-Blériot, made an attempt to fly to London. He came down near Dieppe at about 7.30, in a cornfield. He got away again at 4.30, passing over the racecourse and casino on his way to Calais via Boulogne, ultimately landing at Fort Vert about 15 kil. short of Calais.

A Sign of the Times.

IN the battleships provided for in the current year's British Estimates, the design it is stated from an authoritative source, allows for a curved armoured upper deck and funnelled protection to resist attack from aircraft.

An Aeroplane Auction.

ON Wednesday next, September 4th, an important auction sale is taking place at the Humber Works, Coventry, the company having determined to dispose of their aerial productions and machinery connected with aviation. Mr. Chas. B. Odell, the auctioneer, in addition to offering eight aeroplanes, a number of finished engines and parts, including a 50-h.p. Gnome, will also dispose of the plant comprising four 100-h.p. gas engines and producers, a large number of milling machines, screw-cutting lathes and other types of machine tools. There are no less than 263 lots catalogued, and we would recommend those interested to apply to the auctioneer for a copy of the catalogue at 53, Hertford Street, Coventry.

Gordon-Bennett Contest.

LAST week Vedrines and Prevost, who with Andre Frey are taking part in the Gordon-Bennett Contest in America on behalf of France, left by "La Loraine" for the United States.

Aircraft in French Military Manœuvres.

VERY valuable lessons should be learnt in connection with the aeroplanes which will participate in the French Manœuvres, starting on September 9th, and lasting for about ten days. There will be some 50 aeroplanes and 4 dirigibles taking part, divided between the two armies, in each case one dirigible being kept in reserve. There will be eight escadrilles, four to each side, each escadrille comprising six aeroplanes. The Blue Army Aerial Section will be under the command of Lieut.-Col. Bouttieaux with, as captains of the escadrilles, Capt. Schneegans, Michaud, Bellanger and Casse. With the Red Army, Lieut.-Col. Estienne will have charge, with Captains Carlier, Leclerc, Eteve and Francezon. The two dirigibles will be—Blue Army *Le Dufuy-de-Lone* (Capt. Neant). Red Army, *P. Adjudant Reau* (Capt. Reneaux).

FOREIGN AVIATION NEWS.

Paris-Berlin.

ALWAYS with the Pommery Cup in view, further flights, with Berlin as the objective, are cropping up in different directions in France. M. Frantz was the latest to try, he starting on a Savary biplane fitted with Chauviere propeller and Labor-Aviation motor on the 22nd inst. from Chartres at 5.14 a.m. in a wind of 8 to 10 metres. He came down at Monchy-Lagache, 15 kiloms. from St. Quentin, at 7 o'clock, resuming his journey almost at once, but ultimately being forced down by a violent storm at Mons at 8.20 a.m., slightly damaging his machine when alighting. He returned by rail to Chartres for a new wheel, so that he might fly back to Douai, which he reached on Monday last. He proposes to have another try in about a week. For the 320 kiloms. covered his speed was about 140 k.p.h.

Gastinger Up on the Clement-Bayard.

STARTING on Sunday from Crotoy at 3.7 a.m. on the Clement-Bayard steel monoplane, Gastinger arrived at Issy at 5.12, flying at an average altitude of about 800 metres most of the time against a strong south-west wind, and passing through a storm at Pontoise.

Chalons to Mailly.

ON the 20th inst., Lieuts. Battini and Varcin returned from Chalons after taking part in the Michelin Target Contest on the 2-seater Maurice Farman, flying all the time against a very strong headwind. Two hours were occupied in covering the 55 kilometres.

A Despatch by Aeroplane.

STARTING from the Avor Aviation Camp on the 21st inst., Lieut. Cheutin, accompanied by a passenger on a military Farman biplane, steered over the Bourges Condé barracks in the centre of the town, dropped a despatch for the Commandant, and then returned to his post.

Deperdussin Hydro-Aeroplane Test.

BUSSON, last week, was trying out a Deperdussin hydro-aeroplane on the Seine at Juvisy, the machine being a similar one to that taking part in the British Military Trials fitted with three floats. Although Busson had never tried a hydro-aeroplane before, he made a bold bid for success and, with his mechanic as passenger, he was well in the air within 50 metres of his start.

A Farman for Norway.

ON the 22nd inst. Maurice Farman at Buc was trying out a new biplane for the Norwegian Government, making a long flight with a passenger, he subsequently handing it over to Bernard, who was further testing it over Trappes, St. Cyr and Versailles.

Bathiat on a 80-h.p. Sommer.

ACCOMPANIED by a passenger, Bathiat, on the 22nd inst., flew from Mourmelon to Mouzon on the new 80-h.p. two-seater Sommer-Mono. After a short rest he returned, covering the distance between the two places in 1 hr. 40 mins.

Sappers Making Headway.

ON Saturday at the Farman Military Aerodrome at Rheims, Sapper Seguin got away in a strong wind, steering for Toul, where he arrived after an hour and a half's flying at a considerable height. In the meantime Sapper Foulquier put through their first experience on the aeroplane a Greek captain, and a dozen sappers belonging to the balloon corps.

Lieut. Battini Makes a Good Cross-Country Flight.

ACCOMPANIED by his mechanic, Lieut. Battini, on Sunday, starting from the Maily Camp descended without any untoward incident at St. Cyr, although a strong side wind was blowing, the flight occupying about 2½ hours.

Austria-Hungary Buying Aeroplanes.

IT is announced that some fourteen aeroplanes have been acquired by the Austro-Hungarian Army in connection with their forthcoming manoeuvres.

An Italian Pilot Drowned.

ON Sunday, Lieut. Manzini, whilst reconnoitring on his Blériot off the coast near Tripoli, was precipitated into the sea and drowned.

Sebastopol to Feodocia.

LIEUT. JOUKOFF, on a Farman, carrying a passenger, flew on Friday from Sebastopol to Feodocia, 213 kiloms., in 2 hours.

£4,800 in Prizes at Chicago.

FOR the aviation meeting at Chicago under the auspices of the Illinois Aero Club from September 12th to 21st about £4,800 has been apportioned for prizes. A splendid programme has been arranged including the usual duration events, speed races for monoplanes and biplane with and without passengers, for quick get-aways, bomb throwing, and a number of other features in which no doubt some startling stunts are likely to be forthcoming.

MODELS.

Conducted by V. E. JOHNSON, M.A.

Rule for Rubber Motors.

REFERRING to Mr. W. P. Dean's rule, given in August 10th issue—Mr. R. B. C. Noorduyn (of the Rotterdam Model Aero Club, and winner of the Gamage Challenge Cup, 1912) writes as follows: With reference to Mr. W. P. Dean's rule—I think, and probably most aeromodellists will agree with me, that a hard and fast rule is impossible, as so many things (such as surface, weight, head resistance) in which no two machines by different makers are exactly alike, have to be taken into account—as they determine diameter and pitch of propellers, which, in their turn, determine the number of rubber strands.

All the same the question of the number of rubber strands to a certain propeller is worth going into since, firstly, it is invariably a snare to beginners, and secondly, it decides the efficiency of a model—the thing to aim at. Presuming it is the ordinary "flying stick" type that Mr. Dean is referring to, according to my experience the power he gives is too high, not that that is to be looked upon as a criterion, but it will serve for comparison with the results of others, so I state it for what it is worth.

I quote some of my models as an example:—

1. 7-ins. propellers; 13 ins. pitch; 4 strands $\frac{1}{4} \times \frac{1}{8}$ strip.
2. 8-ins. propellers; 25 ins. pitch; 6 strands of same.
3. 9-ins. propellers; 32 ins. pitch; 6 strands of the same.

The last named being the machine which won the Gamage Cup, span 20 ins., length 38 ins., A.R. 4, weight $4\frac{1}{2}$ ozs., revolutions of propellers per minute 715 (the propellers were very hollow bladed).

The above quoted models are all hand launched (1-1-P₂-0 type) numbers 1 and 2 being medium speed propellers. Self-rising models 10-in. propellers, 21 ins. pitch, 8 strands $\frac{1}{4} \times \frac{1}{8}$ strip. This machine has a length of 36 ins., span 24 ins., and is provided with a rectangular frame, so that the thrust is applied exactly in the direction of the line of flight.

"Frictional wake" appears to be a great thing—any kind of tractor fairly has to hum to get a decent result. [With this latter remark we do not agree at all, as we know quite a number of tractors which give good results without humming.] A thing that struck me in the competition referred to was that so many of the machines were very much over-powered. This makes a fine spectacular flight, but it is no test of their capacities, and no use in a distance or duration competition. The height is of no use for gliding, as the gliding angle is bad on account of the weight. [Not necessarily; it depends very largely on the design of the model. We know of some very heavy models which have decidedly good gliding angles. Presumably, however, Mr. Noorduyn is referring here solely to the weight of rubber; it will be noticed no reference is made to directional control, a most important factor in a distance competition.]

Mr. E. N. Joyce (St. Margaret's Bay) is of much the same opinion, considering the amount of rubber employed by Mr. Dean as excessive, and instances the following: "I have made a model weighing 5½ ozs., driven by two 9-in. propellers with 6 strands $\frac{1}{4}$ strip, and have had flights of 350 yds. at 70 ft. altitude. I thought this rather poor for my model's size, but according to Mr. Dean it is under-powered."

A lady correspondent also writes somewhat naively as follows: "I am only a girl model aero maker, but I must say I do not agree with Mr. Dean. I consider he uses much too much rubber—has he really experimented satisfactorily?"

[Presumably he has not.]

Mr. E. T. Simpson's Model Blériot.

Mr. Simpson writes, in reply to Mr. Adam's enquiry re his model Blériot (August 10th issue), that the data required are:—

Duration, 30 to 40 secs.; r.p.m., 700 approx.; kind of propeller, Chauviere type; 15 ins. pitch approx.; number of turns given to rubber motor, 900 to 1,000.

Exhibition in New Zealand.

Mr. B. Hughes (hon. sec. Dunedin Aero Club) writes stating that an exhibition is to be held there during October or November, and that they would be pleased to receive exhibits from readers of FLIGHT. Their president's London agents are Messrs. Neild and Wilkinson, of St. Mary Axe, E.C., who are collecting the exhibits and forwarding them on.

Model Club for Ladies.

Miss M. Boundy (Branslow Lodge, 177, Croydon Road, Anerley, S.E.) would be pleased to hear from any ladies interested in model aviation, with a view to forming a club for ladies only.

Replies in Brief.

E. N. JOYCE.—Try Messrs. Gamage and Co., High Holborn.

J. C. BALDIN.—Received with thanks, and will use later.

J. AKERS.—Regret the drawings sent are not sufficiently clear for reproduction.

KITE AND MODEL AEROPLANE ASSOCIATION.

Official Notices.

British Model Records.

Hand-launched	Distance ...	A. E. Woollard	477 yards.
	Duration ...	A. F. Houlberg	89 secs.
Off ground	Distance ...	F. W. Jannaway	84 yards.
	Duration ...	G. Rowlands	30 secs.

Official Trial.—The first official trials for hydroplanes takes place to-day after the hydro-competition at the Welsh Harp. Also, if ready, a steam power-driven hydroplane will be tried by Mr. H. H. Groves.

Open Kite-Flying Competition to be held on Wimbledon Common, September 14th, 3 o'clock. For the most practical and useful method of employing a kite or kites to the following:—Life saving, life line carrying, photography, wireless telegraphy, signalling, or meteorological observation. Prizes: 1st, silver cup; 2nd, a "British Aerokite" kite outfit; 3rd, bronze medal of the Association. Rules: 1. Competitors must be at the judges' flag at 2.30 sharp. Any competitor not present at that time will be disqualified. 2. Every competitor will be called upon to demonstrate his idea. Entries close Saturday, September 7th. Free to members; non-members' entrance fee, 2s. Junior kite competition (under 16 years). Prizes: Prizes presented by the Aerial League, 1st, 25s.; 2nd, 15s.; 3rd, 10s. Free to members; non-members' entrance fee, 1s. Rules: 1. Competitors may submit any kite, either home-made or manufactured. No kite to exceed 30 square feet in area. 2. A bugle will announce start and finish of competition. 3. Competitors will raise kites when bugle sounds, each kite having a chord 300 yards long. The chords can be of any size or kind. 4. Competitors must be at the judges' flag at 3.30 sharp, to measure off lines. Any competitor not present at that time will be disqualified. Marks will be awarded for angle, stability, strength of construction, and collapsibility. The maximum of marks is 100; 25 marks for each test. If less than 5 starters the 3rd prize will be withheld.

27, Victory Road, Wimbledon.

W. H. AKEHURST, Hon. Sec.,

MODEL CLUBS.

Aero-Models Assoc. (N. Branch) (15, HIGHGATE AVENUE, N.).

To-day (Saturday) competition for duration. Tractor flyers will receive twice the result of flight in secs. Prize: Goods, value 3s. 6d., to be selected by the winner.

Blackheath Aero Club (48, HAFTON ROAD, CATFORD, S.E.).

RAIN Saturday, no flying. Sunday, Dollittle flew 0-1-1-2-2; others flying, Whitworth, Plummer, Hunt and A. B. Clark. Flying Grove Park and Blackheath next week-end.

Birmingham Aero Club (8, FREDERICK ROAD, EDGBASTON).

COMPETITION results, August 24th:—English championship (B'ham Aero Club Challenge Shield) and Midland championship (silver medal): 1. G. Baker (B'ham), 84 secs. duration; 2. H. S. Melhuish (Worcester) (83 secs.). Distance (silver medal): E. Trykle (B'ham), 395 yards. Rising from ground (bronze medal): H. F. McManus (B'ham). Tractor models (silver medal): L. Riley (Coventry), 31 secs. Hydroplanes (silver medal): Mr. G. Wilde (B'ham). Towed flights have been made with Trykle's glider, the best being by P. Rogers (110 yards at about 20 ft.). Short free glides have been made by various members. Meeting, White Horse, Congreve Street, September 1st, 8 p.m. Non-members invited to attend.

Bristol & West of England (CLIFTON DOWN HOTEL, CLIFTON).

MODEL glider competition at Keynsham, on 24th inst., won by Mr. Lee (duration 23 secs.); 2. Mr. Keyte (17 secs.). Club glider out for inspection and short glides. Meeting to-day (Saturday) at Sea Walls at 3 p.m.

Colwyn Bay Model Aero Club (FARNDON, COLWYN BAY).

SATURDAY, at club's aerodrome:—Distance: L. G. Bradley, 1st; N. Hall, 2nd; D. Allen, 3rd. Duration: L. G. Bradley, 1st; N. Hall, 2nd; D. Allen, 3rd; D. Bartlett, 4th; F. Cross, 5th. Judge: H. Crompton. Club's room now at Llewellyn Chambers, Colwyn Bay; the committee will be pleased to consider eligible applications for membership.

Maidenhead ("THE ACACIAS," SPENCERS ROAD, MAIDENHEAD).

FLYING during week by Panniers, Humphries, Tucker and Laker. Speed, climbing, duration, distance and landing tests; Panniers and Humphries passed all tests, and Tucker all but last. Flying to-day, weather permitting.

Paddington and Districts (77, SWINDERLY ROAD, WEMBLEY).

RESULT, Paddington cup contest:—Winner of cup and silver-gilt medal, J. E. Louch, of Hackney and District Aero Club (72 secs.); M. Canning, previous holder, won 2nd prize, silver medal (62½ secs.); C. C. Dutton, 3rd prize, bronze medal (46½ secs.). To-day (Saturday) competition on same ground.

Reigate, Redhill and District (8, BRIGHTON ROAD).

MORRIS getting 50-70 yards with scale Blackburn. Also glides off Buckland Hill; longest 490 yards. Others flying, May (tractor biplane), Welch, Norton and Burghope. Books would be gratefully received by committee for library.

Scottish Aero Club (6, McLELLAN STREET, GOVAN).

No flying Saturday, members in workshop, 16, Holland Street. Annual general meeting, September 5th, in Engineers' Institute, Elmbank Crescent, 8 p.m. September 7th, meeting, Paisley racecourse, 3 p.m., for attempts on club records. As the club's new session commences in September, the secretary will be pleased to hear from intending new members. Hon. secretary, Mr. Wm. Foster, "Rochelle," Limeside Avenue, Rutherglen, Glasgow.

Sheffield Model Aero Club (35, PENRHYN ROAD, SHEFFIELD).

RESULTS weekly competitions: Aerial Derby, Mr. L. Wilson first. The following working committee has been elected, and Mr. E. W. Colver it is hoped will be president: Messrs. N. H. Bacon, G. H. Dewsnap, R. E. Rayner, and E. Elliott (hon. assistant secretary). The design by Mr. N. H. Bacon for certificates is greatly appreciated by members. Agreed only first-class certificates be competed for, as follows: 1,200 ft. straight flight, 60 secs. duration, &c. Competition August 31st, Marsh Farm, High Lane, Eccleshall, 3 o'clock.

South Norwood (240, HOLMESDALE ROAD).

JENSEN, Minot (100 yards), Hooker and Streeter flying tractors. Flying every evening, Park Road, at 6.30.

Windsor Model Flying (10, ALMA ROAD, WINDSOR).

25TH inst., new mono. by Stanbrook, and biplane by secretary, repeatedly did 40 secs. Two waterplanes expected Saturday. A glider is to be started shortly, and club would be glad to hear of enthusiasts willing to help.

Yorkshire Aero Club (Model Sec.) (53, WEST STREET, LEEDS).

At Woodhouse Moor, good flights by Whitaker, Braithwaite and Holmes. Kite-flying demonstration by Beckett. Flying to-day at Poppy Field, Beeston.



A PROMISING AVIATOR.—Mr. Sydney Pickles, an Australian, on the single-seater Bristol monoplane, which he has been flying at Brooklands. He has also flown the two-seater, of same make, exceedingly well, doing figures of 8 on it, &c. Extremely enthusiastic and the makings of a fine flyer.

Aeronautical Patents Published.

Applied for in 1911.

Published August 29th, 1912.

17,528.	L. H. CARROLL AND E. SCHULTZ.	Aeroplane.
19,089.	G. SMELLIE.	Aeroplanes.
19,976.	J. WIESE.	Flying machines.
23,194.	L. MARMONIER.	Automatic stabilizer.
23,494.	L. MARMONIER.	Automatic stabilizer.
25,040.	J. BARCZ.	Flying machines.

[Owing to the importance of the Military Trials causing exceptional claim upon our space, a number of illustrations and our usual features are held over this week.—Ed.]

PRINCIPAL CONTENTS

	PAGE
Editorial Comment ...	786
The Value of Aircraft in War.	
Parke's Dive ...	787
The Military Competitions:	
Military Aeroplane Trials and some Side Issues	790
The Trials Officially Ended	795
Our Table and its Lessons...	795
Hydro-Aeroplanes: St. Malo-Jersey Meeting	799
From the British Flying Grounds	800
British Notes of the Week	802
Foreign Aviation News	803
Models. Conducted by V. E. Johnson, M.A.	803
Progress of Flight about the Country	804

FLIGHT

44, ST. MARTIN'S LANE, LONDON, W.C.

Telegraphic address: Truditur, London. Telephone: 1828 Gerrard.

SUBSCRIPTION RATES.

FLIGHT will be forwarded, post free to any part of the world at the following rates:—

UNITED KINGDOM.		ABROAD.	
	s. d.		s. d.
3 Months, Post Free ...	1 8	3 Months, Post Free ...	2 9
6 " " " ...	3 3	6 " " " ...	5 6
12 " " " ...	6 6	12 " " " ...	11 0

Cheques and Post Office Orders should be made payable to the Proprietors of FLIGHT, 44, St. Martin's Lane, W.C., and crossed London County and Westminster Bank, otherwise no responsibility will be accepted.

Should any difficulty be experienced in procuring FLIGHT from local news-vendors, intending readers can obtain each issue direct from the Publishing Office, by forwarding remittance as above.